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THE PHARMACEUTICAL ERA

[*WEEKLY.*]

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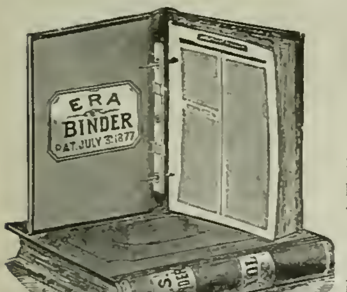


For the convenience of subscribers who preserve their copies of The Era, we furnish a useful binder which will hold the copies for six months (1 Vol.), with the advertisements, or the text pages only, for an entire year.

The "Era Binder," 75 cents per copy, post paid. To foreign countries, $1.00.

Index to Volume XVI.

In this issue is folded a comprehensive title index of the Era for the twenty-seven numbers included in Volume XVI, July 2 to December 31, 1896. This index includes over 2,200 titles, and is one of the most valuable features to the subscriber. Too many druggists look upon their journal as something for current, ephemeral use only, not realizing that its value increases year by year. A ten years' file of an up-to-date pharmaceutical journal furnishes a most complete reference library to the druggist, and he is careless of his business interests if he does not carefully preserve the numbers as they arrive, and at the end of each volume have them carefully bound in permanent form, together with the volume index.

Anniversary Number.

It is evident that our subscribers miss The Era when it does not arrive on time. We have had strong proof of this during the last three days by the postal cards received from subscribers who had not received their copies of the Anniversary Number. It was a big undertaking to issue a 40,000 edition of 250 pages, all compiled and executed within a period of two months, and this, in addition to our regular work. This, however, is not what caused the delay. Everything was in press, and we should have been out on time, but for an accident in the press room. This caused a delay of two or three days, but our subscribers' copies are now all in the mails, and we trust that Uncle Sam's agents have done their part, and our subscribers now have their copies and are happy.

Tariff Hearings.

In the columns of those papers consecrated to the hide-bound opponents of protection, the manufacturing chemists who appeared before the Ways and Means Committee in Washington, on Monday, December 28, are likened to a cohort of mercenaries yelling "Vae Victis," and fairly raving for the spoils of Republican victory. As a matter of fact, for men who represent an invested capital of over $150,000,000 they were, on the whole, rather modest, and, except in some few instances, are to be commended for their moderation of demand. The poor consumer, whom Mr. Benton McMillin, of the committee, so lustily championed, will find life worth living after all. What the manufacturers chiefly demanded was the abolition of the ad valorem method and the return to specific duties. It would be waste of words to dilate on the justice of this demand for the abolition of a method which has been proven to act as a premium upon fraud, misrepresentation and adulteration.

By the election of Mr. McKinley, the voters of this country have declared themselves in favor of a higher tariff—one, at least, which will produce sufficient revenue to cover the expenses of the Government. It has been clearly demonstrated that the present tariff is not sufficient, and that we must raise more revenue, and, no doubt, the buyers of drugs and chemicals would be willing to add their quota to the sum total. There should, however, be no pampering the greed of those manufacturers who clamor for a sky-scraping duty. For such the ideal revenue tariff is a tariff for their revenue only—and let the Government go hang! Chemical manufacturers have so far exhibited no such greed.

It seems but fair, as these manufacturers claim, that foreign houses doing business in this country should pay their share of taxation. Many of these houses are represented only with an office in New York. They pay no National, State, County or City taxes, and have not only deprived local manufacturers of business, but compelled them to meet the competition of the surplus from the foreign factory.

The manufacturers of quinine have requested a duty of 20 per cent., and at the present price of this product this would be about 4 cents per ounce. Considering the very low price of quinine, we are sure that the trade would offer no objections to such a duty, and an increase of 3 or 4 cents an ounce would certainly not be noticed in the price of quinine pills. Such a duty would give our local manufacturers no monopoly, and would still permit of importations from which the Government would receive some revenue.

The New Ohio State Dairy and Food Commission.

Last Friday there came into office and power the recently elected Dairy and Food Commissioner of Ohio. His appointments of his associates were published in this journal a couple of weeks ago, and upon another page of this number appear the portraits of the new commissioner and the three chemists selected to assist him in his investigations.

The drug trade knows what a red-hot condition was engendered in Ohio under the last administration, and it may well be conceived that the new incumbent of the Commissioner's chair enters upon his work under circumstances of unusual difficulty. His every act will be watched, criticized and compared with his predecessor's, and, whatever he does, he is sure not to please all. But he has the best wishes of the druggists, who are confident, too, that he will administer the office honestly, conscientiously and without fear or favor. The outgoing Commissioner is very generally credited with honesty of purpose and effort, but he has had to suffer from a defective law, from the ill-judged actions of others, and from the willful prostitution by some of their public positions to private interests. The new Commissioner can see these pitfalls, and escape them. As a druggist himself, he may better know the necessities and limitations of druggists, and execute the law more fairly in accordance therewith. He has been asked to speak through the Era to the druggists with reference to the law and its deficiencies, and particularly in relation to his proposed programme of service. He says:

"The Pure Food laws of Ohio have been useful in suppressing a very great many evils in this State, and any change should be fully and carefully considered. I believe the law ought to be amended so as to admit the last and only authentic pharmacopœia as evidence in all drug cases. As to the recent decision by the Supreme Court, it should be accepted in good faith, and the law changed as suggested, to admit latest authority.

"Assurances have been given by the chief attorney for the present Commissioner, that all pending cases will be pressed to a conclusion before the end of his term. If any should be left over, each and every case will be considered on its individual merits, and treated accordingly by the new Commissioner. The new Commissioner will fully, fairly and impartially enforce the law to the best of his ability, having in mind the fact that the business men of Ohio are citizens and tax payers, and entitled to fair treatment from public officials, so long as they make an honest effort to observe the law and live up to its provisions. As to violators of the law, they will be obliged to accept the consequences, and no pains will be spared to place the responsibility for adulteration *where it properly belongs.*

From a number of letters received in answer to inquiries from this journal, there are quoted the opinions of two or three leading druggists of Ohio upon this question of the pure food law and its execution.

Fred P. Schanafelt, Canton, Ohio.—"I have no desire to criticize the outgoing Dairy and Food Commissioner of Ohio, or to advise the incoming one. Because I believe that Dr. McNeal and most of his staff are honest, capable gentlemen. Much good has been done by them, and I believe that had it not been for the inborn cussedness of a few members of the staff much more good would have been accomplished, and instead of the feeling of antagonism now exisiting among many druggists there would be a tendency to co-operate with the Commission.

"I have no desire to suggest to the new Commissioner what policy he shall pursue, because that would certainly be presumptuous. I will say, however, that in my opinion the Dairy and Food Commission will never do its best work until the druggist (this view is from the limited standpoint of the druggist, not that of the general merchant), can feel that in the Commission he has an advisor, not a foe.

"The same power that any citizen may invoke against the dealer when an adulterated article is sold him, should be at the disposal of the dealer, to get redress from his source of supply, unless he himself made the adulterated article from the primary or crude materials.

"The fact that the Board of Pharmacy of his State declares him a competent judge of his merchandise should not deprive him of this right.

"It is practically impossible for all druggists to examine or test all packages of drugs bought by them, because in frequent cases their limited capital compels them to buy drugs twice or three times a week. Therefore, the packages are numerous. All druggists should be held responsible for the quality of the goods made by them.

"The fact that they did not make the goods sold by them should not relieve them from all responsibility as to quality. But the law should expressly state that the services of the Dairy and Food Commissioner, his counsel and chemists are available to the dealer (druggist) for his protection, as they are to the consumer for his protection.

"I believe that this idea properly worked out, together with a written agreement between the druggist and his jobber, that all goods sent him must reach the proper standards, would go far toward giving the druggist the protection due him.

"In collecting samples for the Commissioner three instead of one should be taken and sealed by the inspector, in the presence of the dealer. One for the Commissioner's chemist, one for the druggist, and one to be deposited with some county official, to be used in case the report of the Commissioner's chemist is questioned."

John Byrne, Columbus, Ohio.—"While not altogether in sympathy with all the doings of Dr. McNeal in his administration, I believe he was in entire sympathy with all who made an earnest endeavor to do right and refrain from antagonizing him in carrying out the duties of the office which had been intrusted to him, as he thought best. Many, very many, of the suits against the druggists were not his doings, but were brought by over-zealous subordinates who had his entire confidence and used it for personal aggrandizement. Here is where he should be criticized for not finding out the true status of the case before being drawn into it. But it is too late now; he sees his error and regrets it, and now in the dying hours of his administration harsh criticism will do no good—besides it is not true. It is un-American to kick a man when down. When Commissioner Blackburn takes hold of the office he will find a large volume filled with the personal experiences and personal grievances of his predecessor, from which, if a wise mariner, he will shun the rocks that wrecked the bark of Dr. McNeal and his administration. Commissioner Blackburn should receive the cordial support of every honest druggist in Ohio, and they should render him all the assistance possible in ferreting out substituters and all persons wearing the mantle of pharmacy to cover their evil doings. It should be the desire of Mr. Blackburn to assist the druggists of Ohio to amend the present food laws, so as to give them an equal chance before the courts, which under the past administration they did not possess, and not try to defeat an honest purpose by bringing political and official influence, as was the case at the last session of our Legislature, when an earnest effort was made to insert the word "materially" in section 3A, line 2 of the Pure Food and Drug laws as an amendment to that section, but was defeated by influence, as above stated. Not having had any conversation with Mr. Blackburn since his election, I can not state what policy he expects to pursue, but from my knowledge of the man he will pursue the policy of 'malice toward none and justice to all!' "

Old Drug Stores.

There are many old drug stores in this country, but which is the oldest we have not yet been able to discover. Just as soon as one claims that honor, along comes proof that another is older. So we publish in this issue a paper which is not claimed to be exhaustive, but is thought interesting. Others are to follow as material collects, and if any reader finds inaccuracies of statement or fact, he is requested to send in the necessary corrections. With the rapidity of change which characterizes American business life, it is extremely difficult, often impossible in many cases, to trace the history of business houses, and we have no doubt that the publication of these papers will bring to attention other drug stores of an antiquity exceeding any of those mentioned.

Christian G. Euler.

There are hundreds of the readers of the Era who will recognize the face of Christian G. Euler here represented. He has a face not easily forgotten, and this combined with his winning manners brought him many friends in the old days when he was a traveling salesman. He is now associated with W. B. Robeson in the management of Antoine Chiris' American business. The house of Antoine Chiris was founded at Grasse, France, in 1768, and is the largest in its line, which is the manufacture of essential oils and extracts from fruits and flowers. The firm puts out no synthetic products whatever.

Mr. Euler was born at Frankfort-on-the-Main about forty years ago, his parents being numbered among the plain people of Germany, who think more of giving their children an education than of heaping up wealth. He got his first business experience in his native city, and came to this country when he was in his seventeenth year. After engaging in various lines for a couple of years, he secured a position in a prominent essential oil importing house, and has remained in this branch of business ever since. Mr. Euler is associated with Edward H. Hammer in the American Therapeutic Company, whose red marrow preparation, Carnogen, is having a large sale. He is a well-known member of the Drug Trade Club. His home life is enviable. He is of a charitable disposition, and was one of the incorporators of St. Mark's Hospital.

What Will Next be Patented?

Lucium, which chemists have supposed to be a chemical element, has been made the subject of a patent. If this thing keeps on the earth itself may be patented as a whole by some individual who may claim to be its discoverer. We had always thought that a discovery of the sort in question could not be made the subject of a patent, but in this instance it seems not much harm will be done by reason of this pre-emption, as Crookes, the famous English chemist, has decided that lucium is not an element at all, but is merely an impure yttria.

Revenge is sweet. At Harrisburg, Ohio, a druggist is preparing to put in stock both dry goods and groceries. He has had hardware as a side line for some time. If this could only be made to work in the large cities against the department stores!

Correspondence.

We are pleased to publish here communications from our readers on topics of interest to the drug trade. Writers are requested to express their views as briefly as possible. Each article must be signed by its writer, but his name will not be published if so requested.

SHORTER HOURS OF LABOR IN THE DRUG STORE.

New York, Dec. 27, 1896.

To the Editor:

This topic has again been called to our attention of late, through the efforts of Mr. John Gallagher, of the Kings County Pharmaceutical Association. His plan is to secure legislation forbidding the opening of drug stores for more than five hours on Sunday. The five hours are to be at different times of the day, however, namely, from 8 to 10 A. M., from 12 to 1 P. M., and from 6 to 8 P. M. This is a very much interrupted pleasure, and I think it would be much better for those to be benefited if the five hours were taken in one stretch, say from 7 A. M. to 12 M., and the public would get used to this just as well. But now let us see how this would affect those who suffer most under the present system, the drug clerks. Most clerks have a Sunday off every other week, with the exception of probably an hour or two in the morning. Some clerks have to work until noon. To the drug clerk it simply means one Sunday more of interrupted rest, in which he would probably get time enough to read the Sunday newspaper. So I was not very much surprised to notice that they were not very enthusiastic when they heard of the plan. But when I think of the probability of the success of the plan my surprise vanishes entirely.

The opinions expressed in the Era were, as far as I could notice (with one exception) from employers or such as are in business for themselves, and seemed to be about evenly divided, although the majority seem to doubt the advisability of legislation. Some are even hostile to any such intrusion upon their liberty. I really believe that if every druggist could be moved to give his opinion, the majority of them would be against the plan; but, of course, we must await the result of the circulars sent out by the Kings County Pharmaceutical Society. Mr. Gallagher says that as all the druggists would be affected alike there would be no pecuniary losses—but would they be affected alike? I think not. There is, for instance, the druggist whose store is in some side street, or other quiet section of the town. His business consists principally of drugs, medicines and such sundries as the public can generally supply themselves with beforehand. This class of druggists would lose little, if anything. But then, we have another class of druggist whose store is on the principal thoroughfare, and who does a large business in soda water, cigars and other things that the pleasure seeking public demands. His losses would be very material, because such trade would go where it probably properly belongs. But as it is generally a profitable side line, the druggist would not like to lose it. If legislation were secured the result would probably be a side-door business, and in a short time the law would become a dead letter, like so many other laws. Now, here is another point. Mr. Gallagher says the Legislature can legally pass laws regulating the hours of labor for drug clerks, but this would meet with opposition from employers (I think it would, too); because those druggists who hire no clerks would probably choose to keep their stores open from sixteen to eighteen hours a day, and those who do employ clerks would have to work so much longer than their clerks in order to compete with those who do not. This is another point where I differ with Mr. Gallagher. The small storekeeper is very often even worse off than drug clerks, as far as long hours and indoor confinement are concerned, and would gladly close early if it was not for the large stores he has to compete with.

Now, for J. J. McL., your correspondent in the Era of December 17. He is the only drug clerk who demonstrated his interest, as far as I know, although he mentioned Mr. Kelly as one. I did see Mr. Kelly's letter. A gentleman by that name did open a discussion on the subject about a year and a half ago, but that certainly cannot be said to favor this plan. In fact, I doubt if he would favor it. Every drug clerk in the land certainly has cause to be interested in a shorter hour movement, but I for one do not favor this one. I will repeat again what I have said before (about a year and a half ago in the Era). If drug clerks want relief from this system of long hours, *they* are the ones to organize and wipe out this iniquitous system of slavery. They can do it with or without legislation—in fact, legislation without a strong organization would be useless. But then, there are three barriers in the way. The first, as our correspondent rightly states, is fear of their employer. This fear, I am sorry to say, naturally exists, and not without reason. It is this fear which demonstrates the utter impossibility of ever solving this problem without the opposition of most of our employers. Besides, who ever heard of the employers in any trade or industry organizing for the benefit of their employés? (By the way, this might give us something to think about—a "free country," inhabited by a "free people," the "free" employés of which are obliged to submit to a form of slavery for fear of their equally free employers. This condition of affairs brings the term "freedom" in disrepute).

Then, there is another reason which prevents drug clerks from organizing. It is, they think, not becoming to their professional dignity to organize trade unions. This, I say, is false pride. There certainly is no dignity in submitting to present conditions, and the sooner such conditions are wiped out will there be cause for dignity in our ranks. Last, but not least, is the fact that there are many of our colleagues who at some future time hope to be in business for themselves, and as employers would like to benefit by this system of long hours. This is a kind of selfish reason.

It is in the overthrowing of these barriers that the solution of the "Long Hour Problem" lies.

Overcome this fear, false pride and selfishness! Organize, and success is ours! Not before. AMICUS.

THE TRAVELING MAN HAS FRIENDS.

Chicago, Christmas, 1896.

To the Editor:

Nearly a year ago an article appeared in the Era under the caption of "Burning Questions," in which the author referred to the traveling man as a "burning cinder" and one of several objectionable features mentioned therein. I have watched patiently each issue of this favorite journal of mine for a reply to this unjust classification of the traveling man.

By the term traveling man I refer to that class of men whose duty or occupation it is to sell goods, establish new business, and perpetuate the good will of the firms they represent to a profitable end. Possibly this class of men have cared so little for the author's opinion on such subjects they did not deem it worth while to make a defense; at any rate, I have seen no answer, and I believe the Era, having given space so frequently to the opinions of this esteemed pharmacist, will be glad to hear from the defendants in this case.

It is unfortunate indeed that any druggist should so detest this class of men as to be obliged to include him among the objectionable features of his business.

As no distinction was made in the article referred to, I am forced to include in the title of traveling man the truest and staunchest friends which I possess. For four months I myself occupied a position of a retail druggist in connection with my duties as a traveling man, during which time I never found it necessary to avoid his solicitations, and I had no spare time on my hands either; but an amiable request to come in some time when I was not too busy was always sufficient to secure his good will, and in him a future friend of greater value than a "burning cinder."

Christmas night will find many of these burning cinders compelled to content themselves by the hotel stove rather than by the fireplaces of their own homes and among their wives and children, wondering themselves how to solve certain burning questions, which enter the life of every man in business. Put yourself in his place a moment, with a grip in your left hand, a readiness to shake hands in the other, then enter the store of some amiable man, who neither wants to see your grip nor shake you by the hand, and you have your first "burning question." Encounter this twenty-one times on a hot day, and if you don't think the stamp and telephone business pretty cool, then I am mistaken.

Fortunately, a great majority of pharmacists are not of this icicle sort, which tends to make "cinders" of traveling men.

In no store on my trips do I find the proprietor more cordial and kind than in the one which I believe has the largest business. In this store the proprietor is always busy, but always cordial; he is tired, but always willing to say how-do-you-do and good-bye in a way that wins for him a warm place in the heart of every traveling man he meets. This same spirit is shown to the seller as well as to the buyer, consequently his business is good, his clerks satisfied and respecting, and after all he has few "burning questions" to ask of any one. The drummer is hired to sell goods; he likes to sell goods; he does sell goods; in fact, it becomes a ruling passion in him to sell goods, and he is nine times out of ten a mighty good fellow if you will give him a chance to be. You may often times sidetrack your own wrath by a kind word to this drummer, who may in turn drop twenty-five cents in your cigar case that would otherwise have gone to your congenial competitor across the way. He may live in your neighborhood, you can't tell; perhaps his soda drinking sweetheart does, if he doesn't.

From the drummer you hear many a fact you never knew before. Many a time your eyes are opened to new ideas—and new prices; new goods and new people; his opinions are not always worthless; he sees more of the world than you in your prison drug store; his words of encouragement are not always given with a mercenary motive. In any case, he is one of your fellow men, and a "burning cinder" only when you try to freeze him.

F. E. TAFT.

QUICK METHOD FOR PREPARING POTASSIUM FERRICYANIDE.—To a solution of 26 grams of yellow prussiate of potassium in 200 cc. of cold water, 8 cc. of hydrochloric acid (U. S. P.) are added, after mixing, 300 cc. of a 6 per cent. potassium permanganate solution are added, and the entire mixture allowed to stand for several hours. After completion of the oxidation the mixture is neutralized with barium carbonate, filtered, and then exaporated at a low temperature. The first crop of crystals are the purest.

ARTIFICIAL MUSK.—This may be prepared, according to Dr. Valentine, by adding a mixture of equivalent amounts of oil of turpentine and iso-butyl alcohol, in small portions, to 5 to 8 times their volume of concentrated sulphuric acid (cooling well). After 1 to 2 hours the entire product is poured into 5 to 10 times its bulk of fuming nitric acid, using proper caution, then diluting well with water and shaking, whereby a nitro product separates in light yellow flakes. This powder, when collected and washed till of neutral reaction, possesses, when dry, a strong musk-like odor, being probably a mixture of a di-and mono-nitro compound.

OLD DRUG STORES IN AMERICA.

The history of pharmacy in this country, if properly recorded, would, no doubt, date from the original settling of the country. Wherever civilized human society exists a physician is found, and with the physician invariably the apothecary. The history of every old State contains references to druggists, and the files of the oldest newspapers contain their advertisements. As long ago as 1646 the Minutes of the Affairs of Boston Town, in the Colony of Massachusetts, contain an entry to the effect that William Davice, apothecary, was given permission to set up a fence before his hall and parlor windows, three feet from his house. Just where Davice's was, and how long before that time he had been established in business, is not mentioned in the records. Another relic of Colonial days in Boston is the old corner book store, patronized by Emerson, Holmes and Lowell. It is at the corner of Washington and School streets, and was erected in 1712 by a Dr. Crease, as a residence, the front room on the ground floor being used for his business as an apothecary. According to the Memorial History, which is excellent authority, Dr. Crease bought the property on which his house was erected in 1707, and probably established himself in business at that time. The building was torn down in 1711.

The task of finding the oldest drug store in America is a difficult one, for the reason that if the truth were known, undoubtedly one druggist has succeeded to the business of those who have gone before since the earliest times, even though no record has been made of the fact. Thus, it is a matter of record that in another old town, New Brunswick, N. J., one Robert Eastburn, a Quaker, conducted a drug store in 1755. Three of his descendants now have stores in the city, one of them very near its former location, but none of them claims an antiquity before 1820, the date when the oldest store of the three was founded.

An interesting illustration of the antiquity of the drug business is afforded by an advertisement in the "New York Gazette, Revived in the Weekly Post Boy," June 18, 1750. Thomas Wood, the advertiser, settled in New Brunswick as early as 1748, as a missionary of the "Venerable Society for the Propagation of the Gospel in Foreign Parts," for which he received 40 pounds a year salary. He is described in the archives of Christ's Church, New Brunswick, over which he officiated, as "a gentleman of very good life and conversation, bred to physic and surgery." This seems to prove that the medical missionary is not a modern invention. The advertisement referred to follows:

To all Practitioners in Physick.

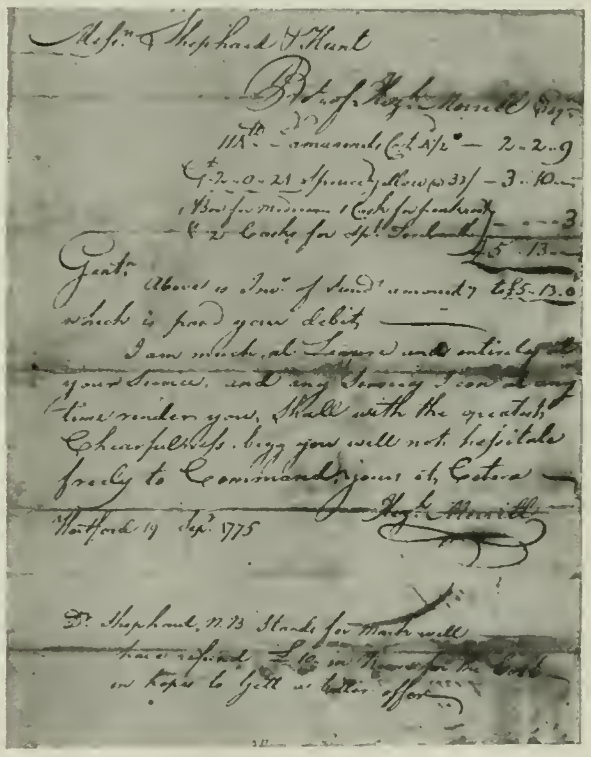
Imported this Spring from London a very good Assortment of Drugs and Medicines which are to be sold at the following most reasonable Rates; also any Part of the utensils of a neat Apothecary's shop, exceeding cheap. N. B. any person who will purchase the whole, may have them at a cent advance; and any one who sends an order for any Medicines and should not be satisfied with any of the Articles shall have their Money returned, if said Articles are returned within a Month after their Delivery.

For Ready Money, York Currency	£	s.	d.
All Compound Waters per Gallon	1	0	0
Canthurides p. Pound		15	0
Conn. Cerv. Calc		2	0
Elect. Mithridat		7	0
—— Theriac Androm		7	0
—— Diascord		3	6
Empl. Diachyl. S.			
—— de Bolo		1	8
—— de Minio			
—— Mellilot			
—— Paracels			
—— Oyeroe		6	0
—— Drach cum Gumis			
All other plaisters in Proportion.			
Gum Ammoniac		7	6
—— Areble		2	0
—— Assoe Foetid		10	0
—— Camphor		14	0
—— Opium	1	12	0
All other gums.			
Manna opt.		10	0
Second sort, ditto		8	0
Sal. Cathert Amer		1	0
—— Mirab Glaub opt		3	0
Ditto, second sort		2	0
Spt. Sal. Vol. Ol.			
—— Lavend C.		7	0
—— Corn Cerv, etc.			
All Spirits and Tinctures			
Fol. Semoe Ale		10	0
Syr. de Spin C.		3	0
Violar Lond		6	0
—— Diacodii		4	6
All other Syrups.			
Mer Dulc per ounce		1	8
—— trac. alb.		3	0
—— Rubr.		1	8
Ol. Anis Chym		2	6
—— Juniper		1	8
All Chem Oils.			
Sal. C. C.		1	6
—— Succin Ver.		16	0
—— Viper per Drachm		10	0
All other Salts.			
Ivory Glyster Pipes, p. Dz.		4	6
Box ditto		3	6
Phial corks, per gross		1	0
Large Velvet Corks		3	6

Gallipots, Pill Boxes, Gold and Silver Leaf, Partly Gold and Dutch Metal, Sieves, etc., and all Sorts of Drugs and Medicines in proportion.

Be pleased to direct to Thomas Wood, at New Brunswick.

Probably the oldest drug store in America is that which was founded in 1769 by Shepard & Hunt, at North Hampton, Mass. It has been a drug store ever since, and in the same location. The list of owners has been as follows: Shepard & Hunt, Seth Hunt, Winthrop Hillyer, Hillyer & Wood, Wood & Kingsley, Charles B. Kingsley, and Charles B. Kingsley 2d. Charles B. Kingsley, Sr., was there for forty years. The present owner has had it nearly sixteen years. Mr. Kingsley has a bill dated Sept. 17, 1775, which is pretty good evidence of the antiquity of his store. It is reproduced herewith.



Mess.rs Shephard & Hunt

Bot of Hez.h Merrill Esq.r

[illegible] — 2-2-9

[illegible] — 3-10

[illegible] — 3

£5-13

Gent.

Above is Inv.o of Sund.s amounting to £5-13-0 which is pass'd your debit —

I am much at Leisure and entirely at your Service, and any Service I can at any time render you, shall with the greatest Chearfullness. begg you will not hesitate freely to Command yours &c Caetera

Hez.h Merrill

Hartford 19 Sep.r 1775

Dr. Shephard, N.B. [illegible] for [illegible] will have refused £10 in [illegible] for the [illegible] in hopes to sell [illegible] better effort

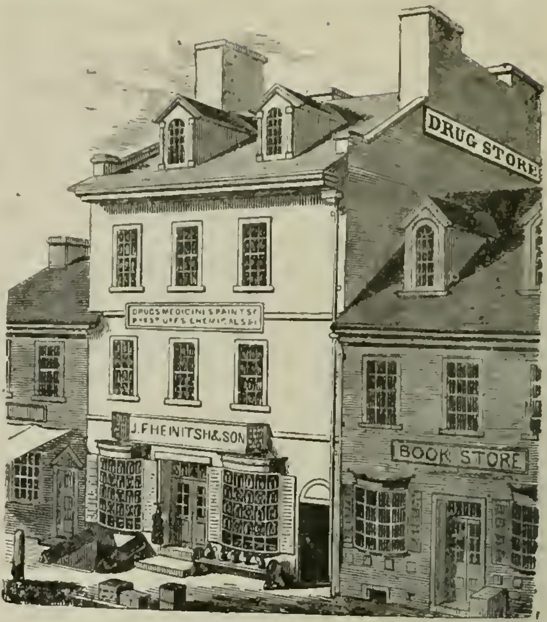
Philadelphia has many ancient business houses, including several conducting drug stores. It is believed that the oldest used continuously for the sale of drugs is on Second street, below Market. It was founded in 1771 by Townsend Speakman, who came from England and set himself up as an apothecary at No. 8 (now No. 24) South Second street, four doors below the old Friends' Meeting House, which stood at the corner of Market street. In 1781 John Hart was indentured to him as an apprentice, and after the good old custom, married his master's daughter, in 1784. Mr. Hart is credited with having manufactured the first soda water sold in this country, at the suggestion of a famous physician of the old times, Dr. Physick, and the apparatus he used and a set of glass shelf bottles brought from England are said still to be in existence. Mr. Speakman supplied many of the medicines used in the Revolutionary Army. He was succeeded by Samuel G. Hart, his son. Edward H. Kaercross was a later proprietor; David G. Potts is the present owner of the store, which still enjoys an excellent trade., Prof. Remington, of the Philadelphia College of Pharmacy is a grandson of John Hart. That this old store was not a pioneer in the drug trade is shown by the following advertisement in the Pennsylvania Gazette, Benjamin Franklin's paper, dated Feb. 15, 1759:

> To be sold by
>
> CHRISTOPHER MARSHALL
>
> at the sign of the Golden Ball in Chestnut Street, Philadelphia: Bateman's Drops, British Oil, Godfrey's Cordial, Daffy's, Squire's and Francis' Female Elixirs, Lockyer's, Andersons and Hooper's Female Pills, James' Fever Powder, Royal Medicinal Snuff, Greenough's Tinctures for Tooth-ache and Scurvy in the Gums, Turlington's and Fryer's Balsams, Bitters, Hungary Water, Likewise Saltpetre, Camphire, Saffron, Antimony, Nutmegs, Cinnamon, Cloves and Mace, Pepper, Drugs, Chymical and Galenical Preparations, Colours and Oils for Painting, etc., too tedious to mention.
>
> N. B. A parcel of choice Bohea Tea, by the Chest or Dozen, to be sold by said Marshall, at the lowest Price.

The advertiser was afterward noted in Revolutionary times as one of the patriotic, fighting Quakers of Philadelphia. Judging from his advertisement, proprietary preparations were almost as common then as now. Other old Philadelphia concerns are: Wetherill & Bro., founded 1777; F. Jordan & Son, 1783; Frederick Brown, 1822; Carpenter, Henzey & Co., 1838, and Blair & Co., prior to 1829. The last-named house, which is located at the corner of Walnut and Eighth streets, has been carried on by three Henry C. Blairs in succession, father, son and grandson. Probably there is not a similar case on record of three generations of the same name having carried on the same business in one location.

E. S. Leadbeater & Sons, of Alexandria, Va., conduct a drug store at which Gen. George Washington used to trade. It was then located about one hundred feet south of the present store, and Edward Stabler was the founder in 1792. He had seven sons, all of whom had an interest in the business at different times. John Leadbeater, a druggist, arrived in Baltimore from England in 1829, and obtained a situation in the old store. He married one of the daughters of the founder of the house, and became a member of the firm, which was then known as William Stabler & Bro. In 1852 his name appeared on the sign of the old store, his son, Edward S., being a clerk in his employ. Among their customers have been George Washington Parke Custis, of Arlington, Va., the adopted son of General Washington, and General Robert E. Lee. Two of the great-great-grandnephews of General Washington are employés in this store.

J. B. Hall's Sons, of Fredericksburg, Va., are also worthy of mention in this connection. Their store was founded by Dr. Elisha Hall in May, 1791. The firm still possesses the old iron mortar and pestle bought with the first stock of drugs in Loudon. John Boyd Hall, the son of the founder, continued the business until his death in 1862, since which time his sons have continued it. The original store was located in a cottage still standing on Main street. Among the constant patrons of the store are some who have done business with it for fifty years or more.



THE HEINITSH STORE, LANCASTER, PA.

The oldest drug store in the country that has been continuously in the same family from father to son is believed to be that of Charles A. Heinitsh, of 16 East King's street, Lancaster, Pa. The business was established by the grandfather of the present proprietor, Carl Heinrich Heinitzsch, a native of Leipzig, in 1782. He had been a clerk in Paul Zantzinger's store, who afterward moved to Philadelphia and became a leading import and export merchant. Mr. Heinitsh has a bill dated 1782, showing a purchase of some drugs in London and Amsterdam. He believes that the store had been in existence at least a couple of years before these bills were issued. Among the relics which Mr. Heinitsh preserves with care are two iron mortars, one of which holds nearly a bushel, two large marble mortars, the largest of which would hold about twenty pounds of mercurial ointment, for which purpose it was mostly used; a small marble mortar, and a three-quart green glass retort, manufactured in England. He has about six pounds of powdered tin and three-quarters of a pound of Flores Martialis, with the original labels on, which were imported by his grandfather. The picture of Mr. Heinitsh's old store, which the Era has published, represents it as it was in 1841; since then the front has been altered, giving a different appearance to the house. The present location of the house is about one-half block from the original site. The original house has been torn down. Probably the most valuable and interesting contribution to ancient pharmaceutical literature, which Mr. Heinitsh has contributed, is a copy of a Pharmacopœia, compiled in 1778, by a surgeon in the American Army for the use of the troops. It is all in Latin. A fac-simile has been printed for the Philadelphia College of Pharmacy. Following is the title page, with the translation:

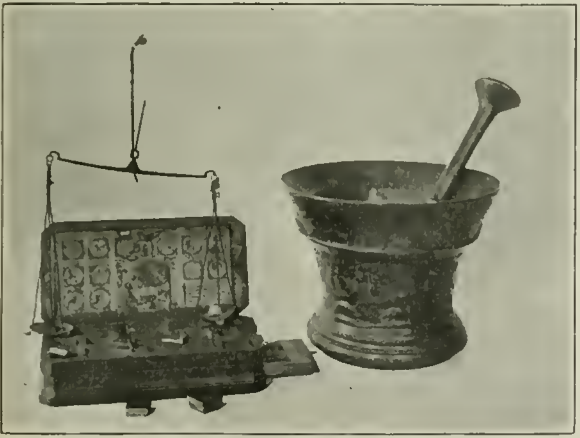
> "Pharmacopœia simpliciorum et efficaciorum in usum noscomii militaris ad exercitum foederatarum Americae civitatum pertinentis; hodiernae nostrae inopiae rerumque angustiis, feroci hostium servitiae, belloque crudeli ex inopinato patriae nostrae illato debitis, maxime accommodata" ("Pharmacopoeia of the more simple and efficacious remedies for the use of the Military Hospital of the Army of the United States of America; particularly adapted to our present poverty and distress, which is due to the ferocious cruelty of the enemy and to the bloody war unexpectedly waged against our fatherland").

Although no drug house in Boston has been able to prove descent from William Davice of the seventeenth century, there are several very old drug stores in that city. In 1792 Stephen Thayer opened a drug store in Washington street, and there has been a drug store on the same location continuously ever since, although the original building has been replaced by a better one. John I. Brown entered Mr. Thayer's employ in 1807, and in due time married Mr. Thayer's daughter. The firm became successively, Thayer & Horton, Samuel Horton, Jr., Horton & Brown, and finally John I. Brown. About fifty years ago John I. Brown & Sons began manufacturing a specialty in a small way, and have become very successful as manufacturers. At one time the family had five stores on Washington street. Other old stores in Boston are those of S. A. D. Sheppard & Co., 1129 Washington street, and Emery Souther, 67 Green street, who is said to be the veteran. Miner L. H. Leavitt, manager of the New England Pharmacal Company, until recently owned a very old store in Boston, the date of its founding being 1802. He has in his possession a number of old delft-ware jars which were in the store ten years ago when he took possession. The tradition regarding these jars is that they were in the first drug store in Boston.

Salem, Mass., has an old drug store, which was founded in 1823 by Benjamin F. Brown. Charles H. Price afterward entered the employ of Mr. Brown, and in 1850 was taken into partnership. In 1860 Mr. Brown retired; the business has since been conducted by the Price brothers, under the firm name of C. H. & J. Price. The founder of the house was a member of the State Legislature and Postmaster of the town. He was a surgeon's mate on a privateer in the War of 1812, and was taken prisoner by the English. Contemporary with Dr. Brown was another apothecary named William Webb, whose store was in the lower part of the town. It is now conducted by his son.

Connecticut lays claim to several old drug stores. C. A. Pelton, of Middletown, Conn., does not know when his store was founded, but it was certainly prior to 1800, as he has a bill of that date made out by the firm of Schieffelin & Co., of this city, for drugs. This bill was recently printed in the Era. Following are the successive proprietors of the store: 1800, S. Southmayd & Co.; 1821, T. & S. Southmayd & Co.; 1823, Southmayd & Boardman; 1830, G. M. Boardman; 1843, H. E. Boardman;1846, E. C. Hubbard; 1849, W. L. Hubbard; 1851, E. C. Hubbard; 1855, C. F. Collins; 1862, Collins & Pelton; 1871, C. A. Pelton.

The oldest drug store in New York is probably that of Caswell, Massey & Co. At the time of the establishment of Caswell, Hazard & Co., there was a law suit to establish which firm should have the right to use the words "Founded in 1780." The whole subject of the history of that firm came under judicial review, and it was positively proven that the original business to which Mr. Caswell succeeded had been established the date named. There is in the store of Caswell, Massey & Co., a mortar and pestle of bronze, bearing the date 1680, and the inscription "Amor omnia vincit." Around the old mortar is a series of pictures in relief, representing a boar hunt in a German forest. One man on horseback, surrounded by his hounds, pursues the boar; on the other side a farmer with a pitchfork attacks another boar, the farm house being hard by; not far off an attendant is blowing a horn.



OLD SCALES AND MORTAR.

Samuel Burdsal.

Robt. B. Folger.

There are, however, several other houses which are very old. The most interesting of these is Oliffe's pharmacy, founded in 1805, at No. 6 Bowery. It is probably the only drug store of so great an age which is located in the original building and uses the original equipments put in by its founder. The history of this store was fully given in a recent issue of the Era. Church's pharmacy, on the Bowery, now owned by Harry Miner, is also a very old one, and dates from the beginning of the present century. Many of the drug stores on the East Side are very old, and their proprietors treasure prescription books dating back in a few instances to 1830, or earlier. This was the fashionable part of New York before the war. An interesting relic, which is pictured herewith, is the set of apothecary scales which now belong to Henry Hasenohr, of 466 Grand street. These balances are believed to have been the property of some apothecary of the Knickerbocker days, as the inscriptions on the cover are in Dutch. The scales are still fairly accurate, but the weights are unlike any now in use. On the cover there is a picture representing the apothecary with his scales, and Death, in the form of a skeleton, seated at the same table. They seemed to be engaged in some sort of a game of chance. There is also a quotation from the Proverbs, to the effect that "a just weight pleases the Lord, but a false balance is an abomination in his eyes." The carving on the box is all done by hand, and is very elaborate.

There was formerly a drug store at No. 3 Chambers street, where the East River Savings Institution now stands. It was conducted by Dr. R. B. Folger, who died only a very few years ago. Dr. Folger manufactured a line of proprietary remedies which he used to place with store keepers by means of wagons which traveled all round the country. The store is kept before the public from the fact that H. Planten, founder of H. Planten & Son, started in business in the same building.

The Western country naturally possesses few antiquities of interest to pharmacy. However, there recently died in Cincinnati, Ohio, Samuel Burdsal, who conducted a drug store which was historical in that city. Mr. Burdsal, at the age of 12 years, was apprenticed to the firm of Goodwin, Ashton & Cleveland (the last-named being the President's uncle). The store was located opposite the site now occupied by the United States Government building on Fifth street, near Main, in Cincinnati. After serving his apprenticeship, Mr. Burdsal entered into partnership for a short time with a druggist named Pennyman, and in 1837 purchased the drug store of Dr. Pulaski Smith, at 409 Main street, where he remained the rest of his life. In those days the apothecary's shop was a place of convivial gathering, and many distinguished men in the history of Ohio were wont to discuss politics around Uncle Sammy's box stove. There Aus Campbell bought the material with which he prepared chrome yellow for coloring hams, and there some prominent pork packers, knowing Campbell's propensity for liquor, got him to give up the secret, which has since proved so valuable. General W. H. Harrison, the grandfather of General Benjamin Harrison, and Ohio's first President of the United States, called Uncle Sammy his apothecary general. Here came in his carryall Dr. Lyman Beecher, father of Henry Ward Beecher, and here too that interesting old Quaker of Uncle Tom's Cabin fame, Levi Coffin, came to talk over the latest slave outrages. Fighting General Bob McCook had a favorite sponge bale in the store, and General Joe Hooker was another patron in his time. Rutherford B. Hayes got his first client in the proprietor of this store, and Jesse Grant, father of General Grant, used to talk over old times with Mr. Burdsal. During the fiat money riots Mr. Burdsal carried safely the coin of a bank. He never changed the dust of years on his bottles, books and drugs, and it became almost precious to him, and the jars of snakes in his window will be remembered with creepy respect by the grown-up children of that city as long as they live. Mr. Burdsal died in 1888, leaving his business to Edward H. Burdsal. It had not been profitable in the later years of his life, because he would not advertise nor cut, and his successor, after struggling in vain to rehabilitate it, assigned on July 1, 1895.

Every city in the Union has its oldest store, and its oldest druggist. The Era would gladly publish more about these historical landmarks, but is compelled to leave many unmentioned for lack of room. Those here, described all too brifly, cannot fail to prove interesting to every lover of the ancient profession of pharmacy.

ALCOHOL LEGISLATION.

It will be recalled that Section 61 of the Customs Laws of 1894, permitting a rebate of tax on alcohol used for manufacturing purposes, was repealed at the last session of Congress, and that a Joint Select Committee of the two Houses of Congress was created, with instructions to obtain information regarding the use of alcohol in the manufactures and arts free of tax, and to investigate all matters relating thereto, with a view to enacting free alcohol legislation.

On Oct. 24, 1896, this committee issued a circular letter of inquiry on the subject in question, which was distributed throughout the country and given publicity in the press, and asked that all possible information bearing on the matter be promptly submitted. On Nov. 23, 1896, the committee held its first open meeting, and has since given hearings to representatives from a number of manufacturing interests. It goes without saying that the interests that cheaper alcohol might affect adversely are claiming that free alcohol would lead to gross frauds upon the Treasury, probably in the hope that by harping upon this single and well-worn string they may make pleasing music to the ears of Congress. But the enormous advantages that would accrue from cheaper alcohol to manufacturers and the public, not only in the cheapening of products and the development of native industries, but also in the development of export trade as well, are so patent that cheaper alcohol must come in time, if certain native industries are to survive.

The larger manufacturers have quickly and earnestly presented to the Congressional committee their views upon the value of cheaper alcohol to their industries and to the public. But we have failed to see that the retail druggists have appeared before the committee and expressed thir opinions, and yet they are as vitally concerned in a legislative movement for cheaper alcohol as any of the larger class of manufacturers. Cheaper alcohol would open up for them untold possibilities in the manufacture of medicinal products, and would do more to develop legitimate pharmacy and compensate for the present demoralized state of the retail business than any other factor.

The opportunity awaits. Will retail druggists grasp it? For years they have protested against the injustice of being taxed as retail liquor dealers for selling liquors on prescriptions, and here is an opportunity which may mean the saving to them of hundreds of dollars a year. Will retail druggists fight for their own interests, or will they sit supinely by and let others grasp the opportunity that belongs in part to them?

It is not our purpose at this time to discuss the letter of inquiry referred to above. That may come later. But what we wish to emphasize is this: If there is going to be any legislation in the direction of cheaper alcohol to manufacturers, the interests of the smaller manufacturers, or retail druggists, should not be allowed to be discriminated against. If the larger manufacturers alone are going to have the right to use the cheaper spirit, retail druggists may as well "hang up the shutters" of their shops and go out of business.

Further, a method of controlling the use of cheaper alcohol, by means of bonded warehouses, is in the interest of the larger manufacturers alone, as retail druggists have neither the capital nor the demand for goods to work under such conditions as bonded warehouses would necessitate. If it be possible for the Internal Revenue Department to protect the Treasury in the collection of taxes upon the manufacture of cigars, as it does in thousands of cities in the country, it certainly should be possible for the same department, through the same official machinery, to properly guard and control the making of medicinal preparations with free alcohol in retail drug stores.

Further, any plan that proposes the use of methylated spirits alone for manufacturing purposes, and does not provide for cheaper grain alcohol, discriminates against both the larger and smaller manufacturers of medicinal products, as commercial methyl alcohol is unquestionably and powerfully poisonous to the human economy, and hence alone, or admixed with grain alcohol, cannot be used in medicine.

We earnestly urge the retail druggists of the country, through their local organizations, to get together and seriously consider the question of the desirability of proper legislation in favor of cheaper alcohol. We feel that if this be done, wise conclusions will be arrived at, and that their interests as manufacturers will be properly presented to Congress, and will receive due consideration. If this be not done, and alcohol legislation is enacted, their interests will most probably suffer.—(Editorial in Alumni Rept., Phila. College of Pharm.)

NEW METHOD FOR PREPARATION OF SACCHARINE.—A new patented process starts with thiosalicylic acid ($S_2(C_6H_4COOH)_2$), which through treatment with phosphoric oxide is converted into the acid chloride; this with ammonia yields its corresponding amide; finally, when oxidized with potassium permanganate benzoic sulphinide is obtained.

TEST PAPER FOR SULPHUROUS ACID.—A paste is prepared by boiling 2 grams of starch with 100 cc. of water, then a solution 0.2 grams of potassium iodate in 5 cc. of water is added, and both well mixed. In this solution strips of filter paper are dipped and carefully dried. The slightest trace of sulphurous acid will cause the wetted test paper to take on a blue color.

ON THE ORIGIN OF ATMOSPHERIC OXYGEN.

Two Notes Addressed to the Academy of Sciences.

By T. L. PHIPSON.

(Translated by Chief Engineer Isherwood, U. S. Navy. First Note. Comptes Rendus, 1893, p. 309.)

I ask permission to present to the Academy the results of some experiments made during the last few years, relative to the chemical composition of the terrestrial atmosphere.

That the primitive atmosphere did not contain free oxygen may be accepted as certain, since sulphur and graphite—combustible substances—are found in the primitive rocks. Dr. Koene, who was for many years Professor of Chemistry in the University of Brussels, says that after the period of intense heat had passed, the atmosphere contained only nitrogen and carbonic acid, the proportions of which gradually diminished as the proportion of oxygen gradually increased.

I desired to ascertain how the plants of the present time were affected in an atmosphere of nitrogen gas, in an atmosphere of carbonic acid gas, in an atmosphere formed by a mixture of these two gases, and in an atmosphere of hydrogen gas. The experiments were made on plans of the genera Poa, Agrostis, Trifolium, Myosotis, Anthirrhinum and Convolvulus. Of all these plants the Convolvulus Arvensis is the best adapted for this kind of experiment, because of the smallness of its size and the rapidity of its growth.

I have elsewhere (Chemical News, 1883), stated ten years ago that microscopic plants (Protococcus pluvialis and P. palustris) vegetating in spring water can be transformed, so to speak, into veritable generators of oxygen gas.

My observations relative to this interesting subject have been published in the Chemical News, of London (June and July, 1893). In these experiments the roots of the plants—immersed either in a fertile soil or in water containing free carbonic acid, and thus exposed to all the substances necessary for vegetating—were kept in the dark, while the upper part of the plant was exposed to a northern light in a graduated inverted glass bell. The daily temperature varied during the experiments from 15° to 26° C.

I ascertained that the plants could live in carbonic acid, but they did not in the least thrive. In hydrogen the vegetating was less backward, but the hydrogen was gradually absorbed (burned by the oxygen secreted by the plant), and after a few weeks it had nearly disappeared. In nitrogen the Convolvulus arvensis can live a long time if the water employed in place of a rich soil is kept supplied with free carbonic acid. In a mixture of two-thirds nitrogen and one-third carbonic acid, the vegetation thrives well, and the composition of the atmosphere resulting after several weeks closely resembles that of our own, and without change of volume.

If the primitive ages of the globe be considered, there must be conceded, and many scientists do so concede, that the high temperature then existing would have prevented the formation of any chemical compound whatever, the matter of the globe being at that time in the state of free atoms; but in measure as the earth cooled the elements combined according to the laws of chemical affinity, until finally the surface of the earth remained covered by an atmosphere of nitrogen gas only, a substance having no tendency to combine directly with other substances. Now, into this primitive atmosphere of nitrogen gas vegetables have discharged oxygen gas during an incalculable period of time, until the air has attained its present composition. The oxygen of our air is thus a result of vegetable life (which latter had necessarily to precede animal life). The carbonic acid gas appropriated by the vegetables must be regarded as a volcanic production.

The primitive atmosphere of nitrogen gas was, without doubt, and owing to volcanic action, richer in carbonic acid than the atmosphere of the present day.

(Second Note. Comptes Rendus, 1894, p. 444.)

Since the publication of my first note (Comptes Rendus, 1893, p. 309), I have a number of new observations, which I have now the honor to place before the Academy.

In my first note I assumed the primitive atmosphere of the earth to have been composed principally of nitrogen, a gas which has only slight tendencies to combine with other substances; and that volcanic action supplied carbonic acid to the land, to the water and to the atmosphere.

Into this atmosphere of nitrogen, carbonic acid and aqueous vapor, the primitive plants discharged oxygen gas, the relative quantity of which has continuously increased from the first appearance of vegetable life.

My experiments, made with a great number of plants of the present day, vegetating in an artificially prepared primitive atmosphere, show that these plants are essentially anaerobic; that is to say, they can live without free oxygen. Thus, the Convolvulus arvensis, for example, vegetating during three months in an atmosphere composed of humid nitrogen and a certain proportion of carbonic acid, converted this atmosphere into oxygenated air, such as exists to-day; and if the experiment be continued sufficiently long, the air in my graduated inverted bells becomes richer in oxygen than our present atmosphere.

The first plants which appeared upon the land and in the waters of the earth were the inferior ones. Now, my experiments show that these inferior plants, these Protococcus, Conferva, Ulva, etc., discharge, weight for weight, much more oxygen in a given time than the superior ones. For example, I found that in one experiment the unicellular Algues gave at least five times more oxygen than the avicular Polygonum.

It may easily be conceived that in measure as the anærobic cellule of the primitive plants was immersed in an atmosphere continuously becoming richer in oxygen, this cellule underwent continuous modification, until at the end of cycles the ærobic cellule was finally produced, a cellule which discharges carbonic acid instead of oxygen into the atmosphere. In this manner I explain the slow and gradual production of animal life.

My researches on this subject have been published in the Chemical News, of London, during the years 1893 and 1894 (4 volumes). In this note I can give only a mere sketch of the new theory to which my observations have led me. These publications had, for object, the following:

(1) That in the remotest geological periods, nitrogen formed, as it forms to-day, the principal part of the earth's atmosphere.

(2) That the presence of free oxygen in this atmosphere is wholly due to vegetation; and that the primitive plants were the means employed by nature to supply the air with that gas.

(3) That the plants of the present day, like those of the oldest geological evolutions, are essentially anærobic.

(4) That in measure as the proportion of free oxygen in the atmosphere continuously increased during the course of cycles, the anærobic cellule became less and less anærobic (mushrooms, ferments, bacteria), and finally completely ærobic (animal life).

(5) That even at the present time the most inferior unicellular Algues give, weight for weight, much more oxygen to the atmosphere than the superior plants.

(6) That in measure as the proportion of free oxygen in the atmosphere has continuously increased during the past long geological ages, the nervous cerebro-spinal system, the highest characteristic of animality, has continuously developed as paleontological investigations show. (Jour. Franklin Inst.)

*THE EFFLORESCENT NATURE OF CRYSTALLIZED QUININE SULPHATE.**

By A. J. COWNLEY.

It would appear from the discussion that is reported to have taken place on Mr. David Howard's "Note on the Estimation of Quinine," that there may be still some uncertainty among many chemists respecting the efflorescent nature of crystallized quinine sulphate.

It is twenty years since, in a paper published in the Journal (Ph. J., (3), vii., 189), I first drew attention to the peculiar efflorescent character of this salt of quinine, and it may perhaps be useful, in view of the uncertainty that still seems to prevail, to recapitulate shortly the facts then established.

1. Crystalline quinine sulphate—containing 7½ molecules of water of crystallization, or 15.32 per cent.—when freely exposed to air at the ordinary temperatnre rapidly effloresceses until it attains the composition of a sulphate containing 2 molecules of water, or 4.6 per cent.

2. Freshly crystallized quinine sulphate approximates, as stated by Jobst and Hesse, to 7½ molecules of water of crystallization or 15.32 per cent.

3. Crystalline quinine sulphate is rendered anhydrous at 100° C.

4. When the anhydrous salt is freely exposed to air at the ordinary temperature it rapidly absorbs water until it has the composition of a sulphate with 2 molecules of water, but when access of air is retarded, the water of crystallization in the salt is of a varying quantity, and bears no constant relation to the salt until molecules of water have been absorbed.

It was because of the results of these experiments that I have always advocated that the official quinine sulphate should be a salt of constaut composition as regards its water of crystallization: in fact, it should be the air-dried sulphate, having, as I then showed, the following composition:

	Molecular weight.	Per cent.
$(C_{20}H_{24}N_2O_2)_2$	648	82.87
H_2SO_4	98	12.53
$2H_2O$	36	4.60
	782	100.00

It is, therefore, a question well worth the consideration of the editor of the new British Pharmacopœia, as the objection to the air-dried salt as a commercial sulphate is purely a fanciful one, namely, that it has lost the fine crystalline appearance of the fully crystallized sulphate. Among its many obvious advantages it certainly would remove from the pharmacist the onus of selling a drug that might be regarded by an over-zealous official "as not of the nature, substance and quality of the article demanded."

The variation in the amount of water in commercial samples of quinine sulphate is shown by the results obtained when examining the purity of the commercial salt; the water of crystallization in the forty samples examined ranged from 8.1 to 15.95 per cent. (Ph. J., (3), xvi., 797).

In conclusion I should like to add that it is to be hoped none of the empirical tests described in detail by Mr. David Howard as having been adopted in the American and Continental Pharmacopœias will be made official in this country, but that satisfactory methods may be suggested for the detection and determination of the other alkaloids in commercial quinine sulphate.

VALSOL.—A new ointment vehicle introduced by Poppelreuter, of Manchester, consisting of a mixture of hydrocarbons impregnated with oxygen (probably like the "blown oils"). This vehicle gives an emulsion with water and shows excellent solvent properties for various medicinal agents, such as iodine, iodoform, ichthyol, creolin, thiol, quinine, etc. It is readily absorbed by the skin.

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* Reprinted from Pharm. Jour.

NEW REMEDIES.

CITRUREA.—A tablet prepared by Radlauer, of Berlin, containing urea, citric acid and lithium bromide.

BROMOSINUM.—A combination of bromine and albumin, containing 10 per cent. of bromine.

HAEMONEIN.—A nutritious preparation made from beef extract, to which such inorganic materials have been added as are contained in normal blood according to the analysis of Denis.

DIDYMIN AND SPLENIN.—Two new organo-therapeutic preparations of English origin, the former being prepared from the thyroid glands of the ox, while the latter is a preparation of the spleen.

SYRUP OF PHLORHYDROPHOSPHATE OF CALCIUM.—A combination of creosote or guaiacol with balsam of tolu, each 10 grams of which contains 0.1 gram of creosote or guaiacol, 0.5 gram of chlor-hydrophosphate of calcium, and 0.2 gram of tolu balsam.

EUCHININ.—The ethyl carbonic ester of quinine, obtained by action of ethyl carbonate on quinine. It forms white tasteless crystals soluble in alcohol and ether. Given in doses of 1 to 2 gm. in the later stages of phthisis, pneumonia and typhus.

CUPRATIN.—Obtained by double decomposition between sodium albuminate and copper sulphate, the preparations so calculated that 8 per cent. of copper falls to the albumen. This preparation, similar to Ferratin, is comparatively non-toxic, so that from 0.01 to 0.02 gram can be given without danger of disturbances arising, it being absorbed to a lesser degree than Ferratin.

CREOSO-MAGNESOL.—A preparation of creosote and magnesia which possesses the advantages of being free from the irritating action of creosote. For preparing this 20 grams of caustic potassa are dissolved in a mortar in 10 grams of distilled water, and with this 800 grams of creosote are emulsified. To this emulsion 170 grams of calcined magnesia are added. The mixture becomes darker and finally hard enough to allow pulverization. It contains 80 per cent. of creosote, and is usually dispensed in pill form.

A NEW PYRIDIN DERIVATIVE OF ALBUMIN has been obtained by R. Cohn (Ber. d. Chem. Gesellschaft) by boiling casein with three times its weight of hydrochloric acid (sp. gr. 1.19). Aside from the well-known decomposition products of albumen, the author obtained a crystalline body which he found to be a pyridin derivative, namely di-hydroxy-pyridin. If this be correct, we can infer the presence of a pyridin ring in the albumen molecule, thus explaining the formation of alkaloids from albumen.

CHINAPHTHOL, or Beta-naphthol-alpha-mono-sulphonate of quinine, constitutes a bitter, insoluble, crystalline powder, which passes unchanged through the stomach into the intestines, where it is split up into quinine and beta-naphthol-sulphuric acid. This preparation contains 42 per cent. of quinine and combines its antipyretic properties with bactericidal action of the naphthol sulphonic acid, being indicated in typhus, dysentery, intestinal tuberculosis, acute muscular rheumatism and puerperal conditions. The dose is 0.5 gm., from 2 to 3 gm. being given during the day.

CHLORAL ACETOPHENONOXIME.—$\left(\genfrac{}{}{0pt}{}{C_6H_5}{CH_3}\!>C=NO.\,CHOHCCl_3\right)$.—A patented remedy which is said to be free from the unpleasant effects of chloral and also acetophenone. It is obtained by bringing chloral and acetophenonoxime together in benzole at low temperatnre, forming colorless prismatic crystals which melt at 81° C., it is decomposed by acids and alkalies.

DI-IODO-SALICYLIC-PHENYL ESTER.—Another rival of iodoform which commends itself because of its inodorous and non-toxic character; also it can be used internally in place of sodium salicylate and potassium iodide. This ester is obtained by interaction between molecular quantities of salol and iodine in alcoholic solution, the liberated hydriodic acid being taken up by the addition of mercuric oxide. The mercuric iodide formed remains behind when the ester crystallizes out. This new derivative crystallizes from alcohol and glacial acetic acid in silky-like needles, which melt at 135° C.

PYRAMIDON.—A convenient synonym for diethylmethyl-amido-phenyl-dimethyl-pyrazolon, which has been prepared by Spiro and Filehne, by replacing the hydrogen of the 4th C. atom in the pyrazolon nucleus by the group $N{<}^{CH_3}_{CH_3}$ Pyramidon constitutes a yellowish-white crystalline powder soluble in 10 parts of water, and tasteless. With ferric chloride an intense violet color is produced, where with its analogue, antipyrine, a red color results, with nitrous acid an evanescent violet color is produced, corresponding to the green with antipyrine. With fuming nitric acid pyramidon gives only a violet or dirty amethyst colored solution, while antipyrine gives first a green, followed by a red on boiling. The physiological action of pyramidon is analogous to that of antipyrine, except that smaller doses produce the same effect, which in the former case lasts longer. The dose is 0.2 to 0.5 gram, dissolved in water.

Loretin Preparations.

LORETIN BACILLI OR SUPPOSITORIES.—Loretin 5 parts, cacao butter 95 parts (5 per cent). The loretin is rubbed with a small quantity of melted cacao butter, then mixed with the rest and moulded.

CERATE OF LORETIN.—Loretin 10 parts, spermaceti 40 parts, benzoinated lard 60 parts, Peru balsam 4 parts.

LORETIN COLLODION.—For a 5 per cent. collodion 5 parts of loretin are triturated with 10 parts of 96 per cent. alcohol, and then added to 85 parts of flexible collodion. For a 10 per cent. collodion, take 10 parts of loretin, 15 parts of alcohol and 75 parts of flexible collodion.

GLYCERITE OF LORETIN.—A 1 per cent. for diseases of the ear passage, take 1 part of loretin in fine powder, and glycerin 99 parts. A 1 per cent. glycerite is used in tuberculous osteomyelitis.

LORETIN CALCIUM GAUZE.—(5 per cent.) According to Dieterich, 20 grams of crystallized calcium chloride are dissolved in 1,460 grams of distilled water. With this solution the sterilized gauze is impregnated, using 1,000 grams (22 to 25 meters, 100 cm. wide). Afterwards it is pressed until the moist gauze weighs 2,250 grams. This is then slowly drawn through a solution of sodium loretinate (50—60° C.), obtained by adding 60 parts of loretin to a solution of 9 parts of calcined sodium carbonate in 1,000 parts of distilled water. The gauze is then pressed and dried by spreading out. The salts employed should be free from iron.

LORETIN ANTISEPTIC DUSTING POWDER.—(a) Loretin 50 parts, calcined magnesia 50 parts; (b) loretin 30 parts, finely powdered soapstone 70 parts; (c) loretin 40 parts, magnesia 30 parts, finely powdered soapstone 30 parts.

AQUEOUS SOLUTION OF LORETIN.—Loretin 1 to 2 parts, distilled water 1,000 parts. Used as an antiseptic wash.

LORETIN VASELINE.—Loretin 2 parts, vaseline 88 parts, yellow wax 10 parts, oil of wintergreen 5 drops; to be moulded into sticks. Used for chafed surfaces.

OINTMENT OF LORETIN.—(a) Five per cent., loretin 5 parts, woolfat 50 parts, petroleum ointment 50 parts; (b) ten per cent., loretin 10 parts, woolfat 60 parts, olive oil 18 parts, distilled water 12 parts. Used in treatment of eczema, burns, etc.

PHARMACY.

BALSAMIC HAIR POMADE.—Cacao butter 50 grams and olive oil 200 grams, are fused together, and while cooling 30 grams of balsam of Peru are added while stirring.

LIQUID POMADE.—White wax 30 parts, olive oil 450 parts, are fused together and perfumed with 25 parts of oil of bergamot, 15 parts of oil of clove and 5 parts of oil of lavender.

CREOSOTE PILLS.—Kathrein (Ph. Post) recommends the following formula: Creosote 10 gm., pulv. licorice root 20 gm., fresh egg albumen, sufficient (5 gm.); make into 100 pills.

ROENTGEN RAYS FOR DETECTION OF LEAD IN MUSK SACS.—The Roentgen rays have been applied for the detection of the fraudulent insertion of pieces of lead into the musk sac with success.

NAPHTHALAN.—An unctuous preparation of Russian origin, possessing a brownish-black color, melting at 65° to 70° C., and containing about 2.4 per cent. of a soda soap, with 97.6 per cent. of a tarrylike oil.

DETECTION OF ARSENIC IN ORGANIC SUBSTANCES.—Nikitin (Ch. Ztg. 257) destroys the organic matter present by employing 3 to 5 cc. of sulphuric acid to each 1 gram of material, aiding the action by the addition of copper oxide. The lost traces of organic material are destroyed, after boiling with sulphuric acid, by adding potassium permanganate, the sulphurous acid removed by boiling, and then testing in a Marsh's apparatus; 0.01 mg. of arsenic can be recognized in this manner, when contained in meat.

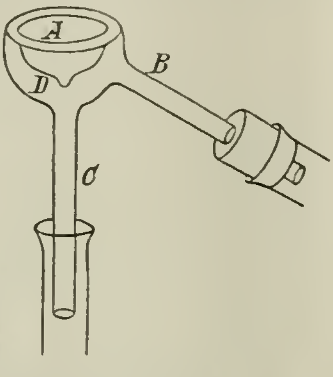
PEACH KERNEL OIL.—K. Dieterich (Phar. Centh.) obtained from 10 to 12 per cent. of a yellowish green oil from fresh peach kernels, which smelled strongly of hydrocyanic acid, being soluble in chloroform, acetone, amyl alcohol and acetic ether, but partly soluble in petroleum ether and insoluble in alcohol and methyl alcohol. The freshly pressed oil gave as Huebl's iodine number 109.7, as ester number 15,887. as saponifications number 16,487, and a critical temperature of 41° C. An old sample gave as iodine number 98.38. The percentage of prussic acid obtained from the press cake averaged 0.0462 p. to 100.

MERCURY FLOATING ON WATER.—C. E. Stromeyer describes in Nature (Pharm. Jour.) a method by which he was able to make mercury float on water. A few drops of mercury, half an ounce of water and a pinch of red lead, red oxide, vermilion or other red powder were shaken together in a small cylindrical bottle. A few small globules of mercury were then found floating together at the center of the water surface. By repeated shaking a small dish—about ⅜ inch in diameter and 1-16 inch deep—was formed, consisting of a large number of mercury globules, and this floated on the water in the same position. The dish did not disappear if allowed to rest, and always reformed after shaking the bottle.

ARTIFICIAL VIOLET ESSENCE.—Schwartz gives the following directions for making an artificial essence of violets: Ten kilogrammes of acetone and 30 grammes of citral are dissolved in 100 kilogrammes of benzol, and to the mixture is added 5 kilogrammes of 10 per cent. solution of sodium ethylate. The mixture is warmed until it assumes a red color, and set aside for twenty-four hours, when some water is added to it. It is then distilled by a current of steam, and the residue is boiled with 15 parts of 7 per cent. sulphuric acid, allowed to cool, neutralized, and distilled. The distillate is a bright yellowish fluid, which in the concentrated state, has an odor of sandalwood, but on dilution has a fine odor of violets. (Chem. & Dr.)

FRUIT MARMALADES.—Bernegan recommends the following formula (Phar. Ztg.), for preparation of 1 kilo of marmalade: Lemon juice 100 grams, sugar 250 grams, apple sauce 450 grams. The mixture is heated for one-half hour (preferably in a vacuo), and then cooled. In this is incorporated 150 grams of egg yolk and 50 grams of Jamaica Rum. In place of lemon juice, various other fruit juices may be employed, as currant, raspberry, strawberry, pineapple, etc.

PRESERVATION OF TINCTURE OF IODINE.—Sapin (Jour. Chim. Phar.) after a number of experiments finds that the preservation of iodine tincture in the dark is without purpose. A sample of the tincture exposed to the direct sunlight lost within a year 17 per cent. of its iodine (as ethyl iodide, hydriodic acid, etc.), while the loss in the dark was 20 per cent. Temperature plays no part in this action, however, the purity of the alcohol is an essential factor. Only the purest alcohol should be used. The tincture should be made up in but small quantites.



NEW COMPACT CONDENSER. for distilling small quantities of fluid from a test tube, is shown in the figure. The vapors pass up through B into space D, which is cooled by placing a small piece of ice in the cavity A: here condensation takes place, and the condensed fluid flows down C into the receiver.

FORMALDEHYDE AS REDUCING AGENT, AND A METHOD FOR ITS VOLUMETRIC ESTIMATION.—Dr. Gruetzner (Archiv d. Phar.) has applied the reducing properties of formaldehyde to the quantitative gravimetric estimation of potassium chlorate, also from this observation he has formulated a volumetric method for the quantitative estimation of formaldehyde in solution.

The author finds that on adding nitric acid to a solution of potassium chlorate, formaldehyde solution and silver nitrate a precipitate of silver chloride forms according to the equations:

(a) $KClO_3 + 3HCOH = 3HCOOH + KCl.$
Formaldehyde. Formic acid.
(b) $KCl + AgNO_3 = AgCl + KNO_3.$

One molecule (122.5 p.) of $KClO_3$ yields one molecule of AgCl. (108 p. of metallic silver), or 0.4385 gm. Ag = 0.49734 gm. $KClO_3$. Experimentally 0.49825 gm. $KClO_3$ were taken, and according to experiment 0.49734 gm. were found. The volumetric method for estimation of potassium chlorate is thus:

About 0.5 gm. of potassium chlorate (accurately weighed), are dissolved in 20 to 30 gm. of water contained in a glass-stoppered vial. To this are added 50 cc. of $\frac{1}{10}$ N silver nitrate solution, about 5 gm. of formalin and a few grams of nitric acid: the stopper is then covered with parchment paper and secured, after which the flask is placed in a bath of luke-warm water for one-half hour, shaking at frequent intervals. After cooling the excess of silver solution is then estimated with $\frac{1}{10}$ N ammonium sulpho-cyanide solution, employing ferric alum as indicator.

Quantitative Estimation of Formaldehyde.—5 cc. of formaldehyde solution (containing 0.14607 gm. of trioxymethylene) with about 1 gm. of potassium chlorate, several grams of nitric acid and 50 cc. of a $\frac{1}{10}$ N silver nitrate solution are mixed in a glass-stoppered flask and treated as directed above for one-half hour. The end of the reaction may be told by shaking and warming the mixture, whereby the clear supernatant fluid becomes turbid. When cold, the excess of silver is titrated by means of $\frac{1}{10}$ N ammonium sulpho-cyanide solution, using ferric alum as indicator. The quantity of formaldehyde is then estimated by multiplying the number of cubic centimeters of silver solution used by 0.009.

DELICACY OF THE VARIOUS TEST REACTIONS OF THE METALS.—Neumann (Chem. Ztg., '96, 763) has compiled the various test reactions of a number of metals, with their limits of delicacy, thus:

Metal.	Reagent.	Limits of Delicacy.
Arsenic (As_2O_3)	Lime water	1 : 4,000
	Electrolysis	1 : 1,500
Antimony	Sulphuretted hydrogen	1 : 100,000
	Lime water	1 : 1,200
	Potassium carbonate	1 : 2,000
Lead	Sulphuric acid	1 : 40,000
	Sodium sulphate	1 : 5,000
	Potassium carbonate	1 : 20,000
	Potassium ferrocyanide	1 : 18,000
	Potassium iodide	1 : 18,000
	Cochineal solution	1 : 400,000
Cadmium	Sodium sulphydrate	1 : 250,000
	Potassium ferrocyanide	1 : 10,000
	Sodium hydrate	1 : 50,000
	Sodium carbonate	1 : 20,000
Iron (ic)	Ammonium hydrate	1 : 800,000
	Sodium sulphydrate	1 : 700,000
Iron (ous)	Potassim ferricyanide	1 : 440,000
	Ammonium hydrate	1 : 500,000
	Oxalic acid	1 : 5,000
	Tannic acid	1 : 440,000
	Sodium sulphydrate	1 : 700,000
Iridium	Conc. sulphuric acid and ammonium nitrate	1 : 1,000,000
Potassium	Platinic chloride	1 : 205
	Tartaric acid	1 : 220
Cobalt	Potassium xanthogenate	1 : 100,000
	Aqua ammonia	1 : 40,000
	Sodium sulphydrate	1 : 1,000,000
	Caustic soda	1 : 10,000
Copper	Potassium ferrocyanide	1 : 250,000
	Aqua ammonia	1 : 50,000
	Sulphuretted hydrogen	1 : 500,000
	Potassium arsenite	1 : 10,000
	Sodium sulphydrate	1 : 700,000
	Sodium hydrate	1 : 30,000
	Potassium carbonate	1 : 14,000
	Hydrobromic acid	1 : 10,000
	Tr. guaiac and prussic acid	1 : 500,000
Magnesium	Aqua ammonia	1 : 6,000
	Aqua ammonia and phosphoric acid	1 : 200,000
Manganese	Silver nitrate and sodium hydrate	1 : 20,000
	Aqua ammonia	1 : 100,000
	Sodium sulphydrate	1 : 500,000
Nickel	Bromine and potassium hydrate	1 : 1,000,000
	Potassium ferrocyanide	1 : 100,000
	Aqua ammonia	1 : 10,000
	Sodium sulphydrate	1 : 1,000,000
	Sodium hydrate	1 : 10,000
Mercuric Salts	Lime water	1 : 4,000
	Potassium ferrocyanide	1 : 1,500
	Alkali hydrates	1 : 6,000
Mercurous Salts	Sodium chloride	1 : 80,000
	Alkali hydrates	1 : 80,000
	Potassium carbonate	1 : 7,000
Silver	Potassium iodide	1 : 4,000
	Potassium chromate	1 : 10,000
	Potassium arsenate	1 : 10,000
	Sulphuretted hydrogen	1 : 35,000
	Sodium chloride	1 : 24,000
Zinc	Aqua ammonia	1 : 6,000
	Ammonium carbonate	1 : 8,000
	Ammonium sulphydrate	1 : 100,000

PRELIMINARY BUTTER AND FAT TESTS.—Gantter's tests have been revised by Vogtherr (Phar. Centh.), calling attention to their value as preliminary tests for distinguishing pure butter from admixtures and other fats. The general procedure is as follows:

(1) 5 gm. of butter (or any fat) contained in a porcelain capsule are covered with 10 cc. of concentrated sulphuric acid (sp. gr. 1.835), and then well stirred with a glass rod until fusion takes place, adding if necessary for this one or two drops of water. The mass is then warmed slightly (cautiously) by a low flame; if the butter contains salt the mass froths with evolution of hydrochloric acid fumes; when the frothing has passed off the vapors of sulphurous anhydride appear, due to reduction of the sulphuric acid by the glycerin and fatty acids. As soon as the vapors of sulphurous anhydride

are noticed (accompanied by slight frothing again) the mass is allowed to cool, a light froth remains, and the following appearances are noted:

Pure butter takes on a cherry-red color, while the froth is of a pale rose.

Margarine takes on various shades of brownish-red. The mass does not become of a uniform color at once, but tenacious dark stripes are formed through the mass, which is at first golden yellow. The froth is light brown.

Lard is colored uniformly yellowish-brown, while the froth is more of a yellow.

Mixture of Butter and Margarine or Lard.—The beautiful cherry color of the butter reaction, which is better observed by rotating the porcelain capsule about, is changed to a dirty brownish violet, the brown shade being more and more manifest the greater the percentage of foreign fat present. The froth retains the rose color from the butter present.

(2) After allowing the mixture to stand for an hour or so till it has become entirely cold, 20 cc. of water are added and by means of a glass rod rapidly and thoroughly mixed. With pure butter the separated fatty acids have a gray and flocculent appearance; frequently, however, the mass fuses and forms a dark gray fluid, which gradually congeals, the penetrating odor of volatile butter acids being observable.

Margarine separates a light-brown fatty substance of the consistency of cold cream, which has but little odor and quickly congeals to a hard mass.

Mixtures of butter and margarine containing 10, 20 and 30 per cent. of the latter show the following:

As long as the butter is in excess, the mixture still shows, after stirring for one-half a minute a dark-gray color; after half a minute the fatty acids of the margarine (not having yet fused), float in the form of white granules in the dark-colored melted fat, the proportion depending upon the percentage (of margarine) present. After a time these fatty acids congeal, the greater the percentage present the more rapid is the congelation; the fatty acids of pure butter remain fluid at least 15 minutes.

The author applied these reactions to various other fats.

Lard gives in cold, with concenrated sulphuric acid, a yellow color, like pure butter; on heating the mass becomes brownish-yellow, with a yellow froth. On adding water the fatty acids separate in voluminous condition (not fusing), having a light-brown color, which after a while goes over into a rose.

Goose fat is turned orange with sulphuric acid unchanged by heating; the froth is yellowish white. The separated fatty acids upon the addition of water form a brownish white mass, which soon turns a violet.

Tallow gives a yellowish-brown color, with cold or hot sulphuric acid, paler than that produced with lard. The separated fatty acids present an appearance like that from lard, but do not take on the rose color.

The above tests, when carried out and compared alongside those produced by pure butter, give fairly accurate results, even if but 10 per cent. of a foreign fat be present. Not only this, but the chemist can readily form conclusions as to the adulterant and frame his further analysis with greater readiness. The butter test stands as follows: 5 gm. of the sample of butter are stirred with 10 cc. of pure concentrated sulphuric acid in a porcelain capsule, and then heated cautiously until sulphur dioxide is evolved. After a short time the mixture takes on a cherry red color, while the froth is of a rose tint; after the addition of 20 cc. of water the mixture must be rapidly stirred for 30 seconds; the separated fatty acids fuse to a dark-gray fluid, smelling strongly of volatile fatty acids. Added foreign fats change the violet to brown hues, and the fatty acids retain their consistency, failing to fuse by the heat generated in the mixture.

QUESTION BOX

The object of this department is to furnish our subscribers with reliable and tried formulas and to discuss questions relating to practical pharmacy, prescription work, dispensing difficulties, etc. Requests for information are not acknowledged by mail and ANONYMOUS COMMUNICATIONS RECEIVE NO ATTENTION

To Stick Labels to Tin.

(H. T. S.) See this journal, July 2, 1896, page 12.

Neutralizing Cordial.

(H. L. S.) See formula No. 388, National Formulary, revised edition. A number of additional formulas may be found in this journal, July 11, 1896, page 48.

Arnica Salve.

(J. A. P.) We cannot give you the formulas for the proprietary articles. A satisfactory arnica salve may be made by any one of the three formulas given on page 761, Dec. 10 issue of this journal, last year.

Bismuth Subgallate.

(S. K. M.) Bismuth subgallate is insoluble in the usual solvents. It is used in doses of 5 to 10 grains as a remedy in the treatment of fermentative dyspepsias and the diarrhœas of tuberculosis and typhoid fever.

Hijertstyrkande Droppar.

(S. B.) Hijertstyrkande, or "heart strengthening drops," is a common Swedish name for Tinctura Lavandulæ Aromatica of the Swedish pharmacopœia. This preparation is identical with the compound spirit of lavender of the U. S. Pharmacopœia.

Remedy That Will Blister in the Shortest Time.

(J. K.) Blisters may be produced by various agents, such as euphorbium, mezereon, iodine, volatile oil of mustard, etc., but the substance generally used for the purpose is cantharides, either in the form of the cerate (blister plaster), or as cantharidal collodion, the latter preparation being the most cleanly, though there is some danger of absorption of the irritant.

Coloring Sugar Red.

(B. W. S.) Both solution of carmine and cochineal color of the National Formulary are satisfactory coloring agents. Various shades of red are also imparted by the following coal tar colors: Fuchsin, acid fuchsin, roccellin, Bordeaux, ponceau, eosin, erythrosin and phloxin. These dyes are said to be harmless in the quantities necessary to produce the colors desired.

Varnish for Chocolate Goods.

(H. T. S.) Dieterich gives the following formula:

Sumatra benzoin	500 grains
Pale shellac	500 grains
Vanillin	7 grains
Alcohol, enough to make.........	16 fl. ounces

Dissolve the benzoin, shellac and vanillin in the alcohol and filter.

See also "Varnish for Confectionery," this journal, Oct. 1, 1896, page 437.

Mucilage of Irish Moss.

(G. F. L.) We can suggest no better formula than the alternative process given in the National Formulary. As stated in the note appended to the formula, the mucilage may be made clear by diluting it when freshly made and still hot, with about 3 volumes of boiling water, filtering and then evaporating the filtrate to a volume corresponding to the proportions used. The filtration may be greatly facilitated by filling the filter loosely with absorbent cotton, and pouring the liquid upon the latter.

According to Coblentz, mucilage of a dark-brown color may be readily bleached by adding a few cubic centimeters of sulphurous acid, agitating and then heating on a water bath, in a capsule until the odor of the acid has entirely disappeared.

Effervescent Citrate of Magnesia.

(W. A. C.) There is no better formula than that given in the United States Pharmacopœia. The National Formulary, revised edition, also contains two general formulas for making effervescent powders, either one of which may be used to produce an effervescent citrate of magnesium. You should have this book by all means. The formulas and general observations and directions on this subject alone are well worth the price of the book.

Disguising the Odor of Camphor.

(S. K. M.) There is probably nothing which will completely disguise the powerful penetrating odor of camphor. Of course, this odor may partially masked or modified by such substances as coumarin, vanillin, etc. Camphor in liquid mixtures like liniments, may be pretty well covered by various essential oils, but just what substances are best suited for the purpose depends upon the manner or preparation in which the camphor is to be used.

Quinine Sulphate and Syrup Iron Iodide.

(W. A. C.) The following prescription is incompatible and should not be dispensed:

Quinine sulphate	2½ drams
Aromatic sulphuric acid	2 drams
Syrup iodide of iron	2 drams
Syrup	1 ounce
Water, enough to make	2 ounces

Iodine is liberated from syrup iodide of iron by sulphuric acid, and this, with the undecomposed iodide precipitates the quinine. If the prescription be used at all the syrup iodide of iron should be omitted.

Cigar Flavorings.

(R. L. R.) The following are from the Era Formulary:

(1)	Orris root	4 ounces
	Valerian root	4 ounces
	Tonka	4 ounces
	Vanilla	2 drams
	Jamaica rum	8 pints
(2)	Fluid extract valerian	1 ounce
	Tincture of tonka beans	8 ounces
	Alcohol, to complete	16 ounces
(3)	Tincture valerian	4 drams
	Butyric ether	4 drams
	Tincture vanilla	2 drams
	Spirit nitrous ether	1 dram
	Alcohol	5 ounces
	Water, to complete	1 pint

Metal Polish.

(W. A. H.) One of the following may answer your purpose. We cannot give the formula for the proprietary article:

1.)	Tripoli	1 pound
	Whiting	1 pound
	Pumice, powdered	½ pound
	Oleic acid	4 ounces
	Petrolatum, enough to make a soft paste.	

2.) The Era Formulary is authority for this one:

Oxalic acid	1 ounce
Crocus martis	2 ounces
Whiting	4 ounces
Water	1 pint

Mix, and shake before using. This preparation makes a good polishing liquid for almost any kind of metal. It may be used dry (omitting the water), or applied with a little oil with rubbing, and rubbed dry with whiting.

Hog Cholera.

(S. K. M.) See outline of treatment suggested by the veterinarian of the Indiana Experiment Station, this journal, Nov. 21, 1895, page 654. The following formula published by the Bureau of Animal Industry is about as efficacious as anything known as a preventive and remedy: Wood charcoal, 1 pound; sulphur, 1 pound; salt, 2 pounds; sodium hyposulphite, 2 pounds; sodium sulphate, 1 pound; antimony sulphide, 1 pound. Give a tablespoonful of the mixture in sloppy feeds, as bran, middlings, crushed oats, etc., once a day to a 150-pound hog.

A formula ascribed to Dr. Haubner, dean of the Dresden Veterinary College, is this one: Sodium bicarbonate, 2 parts; gentian root, 2 parts; ginger, 3 parts; sodium nitrate, 1 part; chalk, 8 parts. As a prophylactic, give 1 to 2 teaspoonfuls twice a day; as a cure, give 1 tablespoonful 3 or 4 times a day.

Moder Draaber.

(S. B.) In Scandinavian communities "Tinctura Castorei Thebaica" is usually dispensed as "Moder Draaber," or "Mother Drops." The original formula for this preparation is the following:

Opii	1 dram
Ammon, carbon. pyrooleos	3 drams
Asafœtidæ	6 drams
Castorei	12 drams
Alcohol dilut	15 ounces

A more modern formula, however, is the one given by Hager, in "Manuale Pharmaceuticum seu Promptuarium."

Castor	20 grams
Asafœtida	10 grams
Water of ammonia;	
Powdered opium, of each	5 grams
Alcohol	150 grams

Mix, allow to stand, and filter.

Prescription Reading.

(S. B.) We cannot reproduce the prescription you submit. However, there is no difficulty in making out the second and third ingredients. Following the prescriber's abbreviations the prescription is:

		Gram.
℞		
Acid. mur. dil		60.
Aq. lauroceras,		
Syr. rub. id.	aa	15.
Aq.	ad	250

M. Sig. ʒj 3 times a day 15 minutes after meals.

The second and third ingredients are "aqua laurocerasi" (cherry-laurel water) and "syrupus rubi idæi" (syrup of raspberry), respectively. The former is official in the British Pharmacopœia and the latter may be found in our own Pharmacopœia. The prescription is evidently one for gastric indigestion.

Witch Hazel Jelly.

(J. W. K.)

(1)	Mucilage of Irish moss, N. F.	4 fl. ounces
	Glycerin	6 fl. ounces
	Witch hazel water, N. F.	4 fl. ounces
	Cologne water	2 fl. ounces
	Sodium borate	30 grains

Dissolve the sodium borate in the witch hazel water, mix with 3 fluid ounces of glycerine and with the cologne, add slowly to the mucilage previously mixed with the remainder of the glycerin. After standing a few hours strain the mixture.

(2)	Tragacanth, in powder	160 grains
	Glycerin	5½ fl. ounces
	Water	5¼ fl. ounces
	Witch hazel water, N. F.	5¼ fl. ounces

Triturate the tragacanth with the glycerin, water and witch hazel water to a smooth paste, and then perfume as desired.

Chicken Cholera.

(S. K. M.) 1.) A remedy promulgated by the Department of Agriculture is strong alum water; 3 or 4 teaspoonfuls are directed to be given daily, mixed with corn meal.

2.)	Carbolic acid, crystals	2 ounces
	Sodium hyposulphite	2 ounces
	Water	1 gallon

Dissolve. Add to each gallon of the drinking water used by the fowls 1 or 2 ounces of the above solution, or the solution may be mixed in the same proportions with a mash made of ground grain or other food.

3.)	Sulphuric acid	1 fl. ounce
	Sulphate of iron	16 ounces
	Water	1 gallon

Mix. Add 1 ounce of this mixture to a pint of water, and supply in place of water to drink. Or, mix with meal or other food.

Syrup of Bromides.

(R. F. T.) We cannot give you the formula for the proprietary preparation. A syrup containing a number of medicinal bromides is this one:

Potassium bromide	640	grains
Sodium bromide	640	grains
Ammonium bromide	384	grains
Calcium bromide	192	grains
Lithium bromide	64	grains
Tincture of vanilla, U. S. P.	½	fl. ounce
Sugar	10½	ounces
Water, enough to make	1	pint

Dissolve the bromides in ½ pint of water, add the tincture of vanilla and filter. In the filtrate dissolve the sugar without heat and strain. Each fluidram of the syrup contains 5 grains each potassium and sodium bromides; 3 grains ammonium bromide; 1½ grains calcium bromide and ½ grain lithium bromide. The preparation may be otherwise flavored, or colored, if desired.

Silver Nitrate, Potassium Iodide and Alkaloids.

(Reader) submits the following prescription for criticism:

Silver nitrate	½	dram
Potassium iodide	4	drams
Morphine sulphate	1	grain
Strychnine sulphate	1	grain

Mix and make into 30 pills.
Use as directed.

No attempt should be made to dispense it. Silver nitrate is incompatible with potassium iodide, insoluble iodide of silver being formed. Potassium iodide is also incompatible with the sulphates of morphine and strychnine. By using an excipient like petrolatum and paraffin melted together, these reactions may possibly be avoided until the pills are taken. However, such a combination is an injudicious one. The size of the pills when completed is enough to condemn the prescription.

Alkaline Antiseptic Fluid.

(R. F. F.) We cannot give you the formula for the proprietary article. A preparation used for a similar purpose is the following (Seiler):

Sodium bicarbonate	1	ounce
Sodium biborate	1	ounce
Sodium benzoate	20	grains
Sodium salicylate	20	grains
Eucalyptol	10	grains
Thymol	10	grains
Menthol	5	grains
Oil gaultheria	6	drops
Glycerin	8½	ounces
Alcohol	2	ounces
Water, q. s. to make	16	pints

Dissolve the salts in 8 pints of water, and the eucalyptol, thymol, menthol and the oil of wintergreen in the alcohol. Mix the two solutions, add the glycerin and enough water to complete the measure, allow to stand 24 hours and filter.

Potassium Iodide, Mercuric Chloride and Morphine Acetate.

(W. A. W.) The following prescription should not be dispensed:

Potassium iodide	3	drams
Mercuric chloride	1	grain
Potassium bromide	5	drams
Ammonium bromide	130	grains
Morphine acetate	2	grains
Fluid extract ipecac	2½	drams
Water, enough to make	8	ounces

Teaspoonful in a wineglass of water 4 times a day.

A more incompatible prescription can hardly be written. Potassium iodide is incompatible with mercuric chloride, morphine acetate and fluid extract of ipecac. Mercuric chloride is also incompatible with nearly everything else in the prescription. These reactions, of course, depend upon the order in which the various substances are brought together.

Tasteless Quinine.

(W. A. C.) We cannot give a formula for the proprietary article. A formula under the title "tasteless syrup of quinine" was communicated to the chairman of the Committee on National Formulary of the A. Ph. A. in 1892, as follows: Tannin, 120 grains; quinine sulphate, 320 grains; water and peppermint water, of each, 16 fluid ounces.

Fenner gives this formula under the title of "tasteless chill syrup:"

2.) Quinine sulphate	128	grains
Potassium carbonate	110	grains
Saccharin	40	grains
Solution potassium arsenite	2	fl. drams
Spirit cinnamon	4	fl. drams
Water	1	fl. ounce
Syrup, enough to make	16	fl. ounces

Rub the quinine, potassium carbonate and saccharin in a mortar with the water, add the solution of potassium arsenite and spirit of cinnamon, then gradually add syrup, rubbing all together to a uniform mixture.

Local Remedy for Cancer.

(J. K.) Arsenic is the chief ingredient in nearly all of the local applications recommended for the cure of cancer. Considerable information upon the use of arsenic in this way may be found under arsenious acid in the United States Dispensatory. Marsden's "Cancer Paste" (see this journal, Aug. 13, 1896, p. 209) may be said to be a typical formula. Another formula is that for Esmarch's "Painless Cancer Powder," which is said to contain arsenious acid 10 grains, morphine hydrochlorate 10 grains, calomel 80 grains, acacia 480 grains.

Applications of this character should never be made under the direction of incompetent persons. Arsenic as a caustic is not only in its action difficult to regulate, but dangerous symptoms of poisoning have resulted from the very ready way in which it is absorbed by the skin. The same remarks apply with equal force to mixtures containing chloride of zinc, tartar emetic and other escharotics. It is the physician's duty to recommend how they shall be used.

Fruit Extracts by the Cold Process.

(I. S.) Your request is somewhat obscurely stated, but we understand you wish a process for obtaining fruit flavors without the use of heat. This may be done by first carefully selecting the fruits, throwing out the unripe or decayed ones. Then mash the fruit in a tub or barrel by means of a wooden pounder, and leave the pulp in a cool place until the liquid appears perfectly bright. This procedure is necessary to separate gummy matter from the juice. Now press out and add 1 ounce of alcohol to each pint of the juice, allow to stand for 12 hours, and filter. The product may now be worked up into syrup by the addition of sugar, or it may be preserved and bottled.

The Era Formulary gives this general process for preparing true fruit flavors: Make a pulp of select fruit; squeeze it out through a fine sieve into a bottle, filling it to the shoulder, cork tight, and fasten the cork with wire. Put in a vessel of boiling water and boil for half an hour. Let the cooling take place in the water, and then cork. Wax the cork. Keep cool and in the dark. When opened, use instantly.

Domestic Ammonia for Cleaning Purposes.

Rub up soap and borax with water until dissolved, strain and add the other ingredients. The perfume may be varied to suit the price.
(B. W. S.)

1.) Soft soap	1	ounce
Borax	2	drams
Eau de cologne	½	ounce
Stronger water of ammonia	5½	ounces
Water, enough to make	12	ounces

2.) Sodium carbonate	20	ounces
Water of ammonia	48	ounces
Water	32	ounces

Mix. Allow to stand two or three days, and then decant the clear solution and bottle.

3.) Here is a formula which yields a cloudy preparation:

Potassium carbonate	1	part
Borax	1	part
Green soap	1½	parts
Stronger water of ammonia	4	parts
Distilled water	8	parts

Heat the water and dissolve in it the soap and potassium carbonate; then add the borax, and, when cold the stronger water of ammonia. If a cheap odor is desired the preparation may be perfumed with oil of mirbane.

NEWS OF THE WEEK.

THE STATE OF TRADE.

The New Year Opens with Business Active and Every Prospect of Improvement.

New York, January 5.—John F. Sprague, Sharp & Dohme's Southern representative, spent Christmas in New York and departed again for Baltimore on December 29. When asked how he found business in the free silver sections of the country Mr. Sprague said that he was doing better this year than ever before. He was inclined to attribute this in part to the fact that the firm's business is a growing one, but he was forced to admit that trade generally is better to-day in all the South country than it was a year ago.

"There is considerable talk in some parts of the South about the hard times," said Mr. Sprague, "but a careful estimate made from a personal canvass of the retail druggists in twenty Southern towns by representatives of Sharp & Dohme, proves that the sales and profits of 1896 are greater than those of 1895. There is no doubt that business is looking up down there, and in those sections where the cotton was sold early in the season the outlook is especially bright."

The general feeling among local wholesalers is that the new year opens with very bright prospects. At Schieffelin & Co.'s. it was said that it was too soon to report from the number of orders already sent in what the season is to be, but there was a hopeful feeling, and many customers had promised orders after the 1st of this month. McKesson & Robbins are experiencing a great deal of business, and express confidence in the good times coming. One ground for their faith is the fact that this is the season for stock replenishing. Bruen, Ritchey & Co. are very hopeful, and report that business is already flourishing with them. Similar reports come from the importers and manufacturers. W. P. Ungerer, essential oils, reports good business with soap manufacturers, and C. G. Euler, of Antoine Chiris, finds trade lively.

* * *

Boston, January 2.—There is a more cheerful feeling in the wholesale drug trade just now than there has been before in a long time. One house after another speaks of the outlook as bright, and trade already is brisk in some quarters. It appears to be the realization of the hope so often expressed here in 1896; that with the new year there would come a revival of the right sort: not a spasmodic jump, but a steady gain from month to month.

At Cutler Bros. & Co.'s Mr. Charles Cutler says that they have no cause for complaint about trade now. Money is coming in better, too. This week has been used for stock-taking, and next Monday the salesmen start out again.

West & Jenney say that trade is good. True, there is not really a rush of orders, but the amount is satisfactory. Collections, however, are still slow.

Mr. Richardson, of the Rust & Richardson Company, says that, as he sees the situation, trade is not only better, but it is improving steadily. His house also finds that it is easier than it was to get bills paid.

George C. Goodwin & Co. report that business is really brisk, though money is coming in slowly. Like other houses, Goodwin & Co. have been taking account of stock, and will scatter their salesmen next week.

Carter, Carter & Kilham report no marked change, which means, so far as they are concerned, a steadily good trade. The Heath Drug Company has found trade slow, except in the matter of bottled goods, in which department there has been a lively demand. Money is still hard to collect. At Gilman Brothers it is stated that trade is noticeably better.

Chicago, January 2.—There is little to report this week in regard to the state of trade. There are lots of people getting over "that head," and drug jobbers are all busy taking stock. The firms report the usual volume for this season.

Morrisson, Plummer & Co. to-day reported a busy day, and Robert Stevenson that the usual amount of business had been going on.

Peter Van Schaack said: "We are all busy taking inventories, getting ready to weigh the pig for 1896. The usual quiet of the first of the year permeates all lines of business, though all look hopefully to the new year. The recent bank failures were not indicative of bad times, but of outrageously careless banking."

* * *

St. Paul, Minn., January 1.—Business in Minnesota's capital city is jogging along at the same old gait. "Just so-so," reply wholesalers and retailers alike to the Era's patent pumping process. "We are still smiling," says Buyer Pierson, of the Ryan Drug Company, and their smiles certainly are not like Tom Moore's "light on graves, with rank cold hearts beneath it," but indicate their satisfaction with the way things generally are going. Noyes Bros. & Cutler are in a similar category. No conspicuous variation in the situation as it has existed for the past month has developed since the last report. In a word, druggists are holding their own and fighting something of a waiting battle, but chock full of hope.

* * *

Minneapolis, Minn., January 1.—Trade has been quite satisfactory here since the last report, two weeks ago. The recent bank failures in this city did not produce so deep an impression in business circles but that it will soon pass away. The banks that suspended were all comparatively small concerns, and their suspension has only resulted in clearing the financial sky. They were disastrous to some individuals, to be sure, yet will prove of great ultimate public benefit here. The Lyman-Eliel Drug Company reports its volume of business considerably ahead of the similar period of last year, with a very heavy holiday trade—infallible sign of more prosperous times. Money continues easy, and no serious legitimate cause for complaint exists.

Slaves to Cocaine.

A remarkable story has been sent out from Manchester, Conn., a silk-mill town, to the effect that the cocaine habit has taken such a hold on residents that steps are being taken to obtain legislative restriction of the sale of the drug. The evil, it is said, had its inception when a local druggist, a year ago, made a preparation of cocaine and menthol, which could be used as snuff. It was intended as a specific for asthma, but the prescription was passed around, and now hundreds of people have become slaves to the stuff. One prominent druggist is reported as saying that, while he has made a lot of money on the sale of the compound, he is one of the prime movers in trying to check the evil habit. It has got to such a point that well-known men and women visit his house at all hours of the night and make him go to the store and get the stuff for them, threatening that if he does not they will break into the place. He says their condition is pitiable. The preparation costs 50 cents an ounce. Some of the slaves buy as much as $5 worth in a week. An experienced physician is set down as saying that he never heard of a place where the abuse of the drug had become so general, and that the future prosperity of the town is involved.

——At San Jose, Cal., the Garden City Drug Co. has opened a new pharmacy at 34 West San Fernando street. C. E. Case, manager.

THE PHARMACEUTICAL ERA

[*WEEKLY*.]

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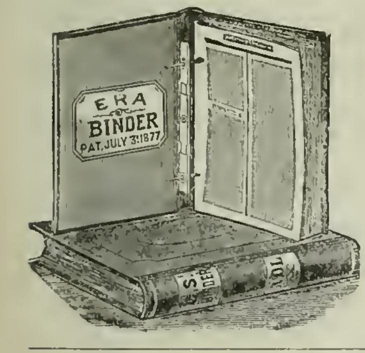

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Better Pharmaceutical Journals.

"You will observe that our most advanced pharmaceutical papers are giving their readers much scientific information of a general character and no longer confine their articles to the purely technical subjects germane to pharmacy. You will find that this tendency is a growing one, and that it will continue to grow with the increase of intelligence and education among pharmacists."

The above are substantially the words employed by the lecturer in one of the leading colleges of pharmacy in the course of his regular lecture a few days ago. The speaker had been explaining to his class the wonders of cross-fertilization among plants. He apologized for this interpolation, excusing it on the ground that any and all general scientific information is of value to the pharmacist, and, therefore, it was only not wholly out of place to mention such matters in a lecture on botany.

But why is any explanation necessary? The speaker's faculty of observation was never more accurate in discovering new floral species than in leading him to make these remarks. There are a few pharmacists of the old school still alive, who view with horror the desecration of the sacred columns of the pharmaceutical press with general science matter, and, particularly, with pictures and news articles. But these old fogies are so far behind the head of the procession that they cannot hear the faintest music from the band, and have fallen out of step. The world is moving on. Intelligence is increasing. The human mind refuses to be cramped. The live pharmaceutical paper must also be a newspaper, something more than a mere recipe book. While depth may be got from specializing, breadth must at the same time be sought by scanning all the fields contiguous to the one especially cultivated, or the best results, even as a specialist, cannot be obtained. There is such a thing as intellectual cross-fertilization. The mind shut up in too narrow limits is dwarfed.

The Free Alcohol Question.

We learn from very reliable source that it is now pretty generally conceded that the Joint Committee on Free Alcohol will at least recommend to Congress two measures: First, that alcohol in a methylated or denaturalized form be granted to manufacturers free of tax; second, that a rebate of the tax paid on alcohol used in a pure form be allowed on articles exported, whether beverages or otherwise.

This is all very satisfactory as far as it goes, but it does not reach far enough. What is wanted is free alcohol for manufacturing purposes, with all that the adjective free implies. We think that among retail druggists there is no difference of opinion on this point. What they do fear and do not want is free alcohol, which shall be free only to the large manufacturers, because of restrictions and regulations which would make its use by the retailer inconvenient and vexatious. If the small manufacturer, the retail druggist, can share in all the benefits and advantages from tax free alcohol, then he wants it, but he does not want it granted upon such terms that he not only cannot profit from it, but must be placed under still heavier competition from the large manufacturer.

There is no valid reason, however, why the retailer should not have free alcohol. It is believed that such provisions can be made in the free alcohol law as will enable the compounding of alcoholic medicines to be continued. But beyond this there are advantages to the retail druggist in a policy of free alcohol which will largely outweigh the possible disadvantages. The use of alcohol in the general household for cleaning, heating and cooking, for domestic purposes, which now amounts to an appreciable quantity, especially in the large cities, would be enormously increased by the great reduction in price. The tax on commercial alcohol, at 188° proof is $2.07 a gallon, while the alcohol itself costs at wholesale about 25 cents. To be able to sell it at the largely reduced price would permit it to be used for general cleaning purposes in the household. For this it has no superior on account of its power to dissolve organic substances. Then, too, its uses for the lighter forms of cooking would be enormously increased, and there would at once be placed upon the market a very great number of spirit lamps for cooking purposes, with a great increase in the sale of alcohol. This trade in large part would come to the retail druggist. It would be a staple trade to be largely relied upon. It can be surely counted upon, and it is an offset to disadvantages which may be feared, but which probably will not exist in other particulars.

Let the entire retail drug trade unite upon the proposition that they favor free alcohol if it be made free for the small manufacturer, as well as the large one, as free for the small retail pharmacist to manufacture his preparations as for manufacturing by the wholesale druggist, the manufacturing pharmaceutical concerns and the proprietary medicine interest. This is both possible and feasible. Demand it.

Get Better Acquainted.

Much as we regret to say it, the fact remains that there is a large class of druggists who are unconsciously slow to grasp an opportunity or take all that should come to them. These are the men who sell what is called for, but never dream of trying to push an article on their own account. They act as if they thought that their customers buy medicines as they do butcher's meat, and as if the arts of a clever salesman were of no avail in a drug store. They are entirely dependent for the disposal of their stock upon the demand created by the manufacturers, and never lift a finger to stimulate that demand or, least of all, create a new one.

This attitude of the druggists has led to a curious mistake on the part of the manufacturers. Because the druggists *do not* create a demand the manufacturers think they *can not*—as if a druggist's word of recommendation were not often of more avail than an advertisement crowded away in the back pages of a magazine! Nevertheless, the fallacy exists in full strength, and every day manufacturers are losing money because, instead of recommending their wares to the druggist and trying to get him, in turn, to recommend those wares to his customers, they ignore him and advertise entirely to the public. Putting the cart before the horse is as little profitable as it is logical.

What the manufacturers have so far failed to do for themselves the pharmaceutical journals offer a medium for accomplishing. Take, for instance, the Anniversary Number of the Era. In its pages retailers and manufacturers are brought into closer touch. The manufacturers' plants, their products and the broad lines of their business methods are described in such a manner as to enable the retail druggist to be a man of his own hands, buying what he thinks will be most profitable to him and pushing it for all it is worth. It is to the mutual advantage of manufacturer and retailer to get better acquainted. The Anniversary Number of the Era will do much to establish and maintain an entente cordiale between them.

Association Proceedings.

The annual volume of proceedings published by the average pharmaceutical association lacks much of what should constitute such a work. Viewed collectively these publications are "fearfully and wonderfully made," and they exhibit a wonderful lack of uniformity in conception, arrangement, style of indexing (if any index be given at all) and dimensions. Some of them really seem to have been gotten up without any comprehensive idea of their practical utility or the information they might furnish.

Preserve your literature has been a theme upon which many a homily has been delivered by this and other journals, and certainly the "proceedings" is or should be an object worthy of this consideration. The volume should be made as valuable as possible to the pharmacist of the State or territory over which the association has jurisdiction. Proceedings that are worth publishing at all possess intrinsic value, and they should fairly represent the aims of those men who have banded themselves together for "mutual strength and advantage."

In many of the proceedings there is lacking just the kind of information the druggist should have at hand and know most about, viz., pharmacy in his own State. The association in this field has possibilities for practical usefulness. We know that a few of them each year publish the pharmacy law or a digest of it. Some also publish a list of the registered pharmacists in the State, but how many do? How many keep their members posted on the changing conditions, legislation, etc., presented each year? How many publish a directory of the local associations in the State? Not many, we are sure. Here is a field which every association might with credit to itself improve. Give the member who takes interest enough to save his proceedings volumes of a uniform size.

A Good Example.

The Vermont State Board of Pharmacy set an example the other day which it were well should be followed by other boards throughout the country. A drug store was damaged by fire, and the secretary of the board inspected the drugs, and all which were damaged or deteriorated by reason of the fire were condemned and thrown out. We do not know just how far the Board of Pharmacy would be legally upheld in transactions of this sort, but certainly the idea is a good one. It is all well enough to have fire sales in the dry goods business, but when it comes to drugs nothing but the best should be allowed for use. Yet we have known of instances where drugs badly damaged by fire or other causes have been sold and used without compunction by the purchaser. Some manufacturers of pharmaceuticals and patent medicines are supposed to be continually on the lookout for job lots of material, and to be not over scrupulous as to the quality of this material, provided the price of the article is right, and some cutters have been accused of purchasing shop-worn and fire-damaged patent medicines at low figures to supply the rapacious demand for these articles. What would be the best way to prevent the sale and use of damaged drugs, it is hard to assert, but one thing is sure, it should be prevented. The action of the Vermont board furnishes a delightful precedent.

Pensions and Testimonials.

Givers of testimonials to the merits of patent medicines should be very careful, for there is occasionally danger in this sort of thing. An old soldier in Massachusetts, having got into print by reason of his testimonial to the "marvelous cure" effected by a well-known patent medicine, was visited by a Government agent to see if he really had been made well. Upon assuring the visitor that his testimonial was an honest one, he lost his pension a short time after. The old soldier must now be satisfied by the restoration of his health, in lieu of his customary quarterly stipend from a paternal government.

George Merck.

It will probably surprise some druggists to learn that the bearer of this name is an unassuming man of only about twenty-eight. It will probably surprise them more to be told that the well known firm of which he is a member is not a branch house, but an entirely independent concern handling the output in this country of several famous foreign laboratories. One of their most valuable connections is the house of E. Merck, of Darmstadt (founded in 1668), and it was in that establishment that George Merck received his first business training.

He was born in Darmstadt, his father being William Merck, a member of the firm of E. Merck and a direct descendant of the founder. The young man had exceptional educational advantages and served with distinction in the Germany army, having the rank of a lieutenant when he took his discharge. He spent a couple of years in the London office of E. Merck, and in 1891 came to this country to join Mr. Theodore Weicker in the management of the American business. These two gentlemen shortly thereafter formed a copartnership having its own capital and its own policy. One of the most recent moves of decided importance undertaken by the firm was to erect a handsome new building at the corner of University and Clinton places, New York, far removed from the traditional drug district. There they have the most perfect appointments that money can buy.

Mr. Merck is one of the most industrious men in the house, reaching the office each day at 8 o'clock, among the earliest arrivals. On pleasant days he rides to the office on his bicycle from his home on West Eighty-sixth street. His home life is exceptionally happy. He was married in 1893, and has two children. In the summer he usually goes abroad with his family for three months, as much for business as pleasure. He is a lover of manly sports and is an accomplished horseman. He is a member of the German Club and various other leading societies and is much liked wherever he is known.

IODOSINUM.—A combination of iodine and albumin containing 15 per cent. of iodine. Sold in solution as "Liquor Iodosini," containing 10 per cent. of iodine.

Correspondence.

We are pleased to publish here communications from our readers on topics of interest to the drug trade. Writers are requested to express their views as briefly as possible. Each article must be signed by its writer, but his name will not be published if so requested.

CONCERNING THE MINNESOTA BOARD OF PHARMACY.

Minneapolis, Minn., Jan. 4.

To the Editor: The appointment of a member on the Board of Pharmacy to succeed Secretary H. Gordon Webster is developing into a somewhat acrimonious controversy. Mr. Webster is desirous of succeeding himself, and to that end has secured the indorsement of and nomination by the State association. Mr. Truman Griffin—who waged war against Mr. Webster at the association meeting last June, for a place on the committee of five nominees as provided by law from which the Governor is directed by statute to choose the appointee, having failed in his attempt to secure the nomination—is active in the endeavor to purloin from Mr. Webster the appointment, in spite of his defeat for the nomination. While Mr. Griffin is proving himself a foeman worthy of the steel of our efficient secretary, it can be said without regard to the fitness of Mr. Griffin (which is not questioned), that his efforts will certainly be fruitless, since such energies have, wisely or unwisely, as they may prove, been provided for in the law governing appointments; the law is mandatory and admits of no juggling, which Mr. Griffin will learn by the sad experience of defeat. The statute is clear and concise, and reads that the Governor shall appoint from a committee of five pharmacists who are actually and practically engaged in pharmacy within the State, and whose names shall be presented by the Minnesota State Pharmaceutical Association. It further provides that any vacancy occurring at any time shall be filled by the appointment of one from the above said five names. Mr. Griffin, it appears, stimulated by the report that L. A. Harding, a member of the present board, was about to resign his appointment, is seeking the appointment to fill such a vacancy, with a view in that case of succeeding Mr. Webster as secretary, but in view of the prescriptive character of the law, it must be apparent to any one conversant therewith, that Mr. Griffin's chances for success are definitely disposed of, for the present at least, and unless Governor Clough entirely disregards the law, a practice which His Excellencey has proved himself not given to, the requiem of Mr. Griffin may be sung even before the ceremony. "REUBEN."

* * *

Wabasha, Minn., January 4, 1897.

To the Editor: In your edition of December 24, page 837, is a letter from St. Paul in regard to Mr. L. A. Harding, and casts some reflections on him. Mr. Harding I have known for a number of years. He has always been a very active member, and shown a great interest in the work. We have never had a meeting, but what Mr. Harding has had from one to three papers on some practical subject that has been of some benefit to some one attending the meetings. If the rest of the druggists of the State took the same interest in the association that Mr. Harding does, we would have the strongest association in the United States and the best.

Mr. Harding is a man of honor in every sense of the word, and would not use his position in the board to help his students pass an examination. Furthermore, the charge that he issues circulars containing offers of "inside facilities" is false. I think I have seen all his circulars, and I cannot remember one that contained anything of the kind. Only a few weeks ago I received one, and there was nothing in it that could lead a man to think of any underhand work. Any one who enjoys the acquaintance of Mr. Harding would not think of his doing anything of the kind. I think the charges must come from one of those druggists who does not belong to the association, but is always whining and "cussing" the association and the board, always looking out for his own interests, and not seeing any farther than the end of his nose. He don't see that if all the druggists of the State would combine they could come pretty near having their own way in a good many things that they can't have now. I have always looked up to Mr. Harding as a first-class druggist and an honest man, and shall continue doing so until I find stronger proof to the contrary than has been presented so far. Very respectfully yours, L. TRAUTMAN.

[The paragraph to which the above correspondent refers received emendation and correction in the Era last week, January 7. Ed.]

CUTTING IN THE DRUG BUSINESS.

No review of the drug business, as it exists to-day in San Francisco, says W. M. Searby (in California Commerce), would be complete without some mention of the "cutting" which now prevails so extensively. While the same thing exists and has existed for several years in many of the large cities in the United States, it is doubtful whether the effects upon those engaged in the business have been as disastrous elsewhere as they have here. If the public had been benefited to a corresponding degree, there would be some consolation, on the principle that "it is better that one man should die than that the whole people should suffer." It is not easy to see, however, that the public have been benefited, while it is apparent that they have been greatly injured and are still suffering daily in many respects.

It is always pleasing to customers to buy what they need at the lowest possible price, the gratification being usually proportioned to the reduction obtained. Whether the seller makes a reasonable profit or suffers an unbearable loss, is no concern of average purchasers, who only consider how cheaply they can buy their supplies. The desire to obtain goods at low prices may be fostered to such an extent that many persons feel it a hardship when they are called upon to pay a fair price for what they need. This condition has actually been brought about in the drug trade by the persistent advertising of certain cutters, who have endeavored to create the impression that they are the friends of the public, and that all others are extortioners, if not swindlers. In point of fact, the extortion and the swindling (if there be any at all) are more apt to be found in the cut stores than in those which make less pretense or friendship for the dear public. If only the latter knew the inside workings of the loud-advertising cut stores, they would give them a wide berth. Let us look at some of the methods pursued to make advertising at cut rates pay.

In the first place, almost every article which is advertised at cut rates is displaced, as far as possible, in these stores by one of their own manufacture, which is either an imitation or a substitution. They advertise Hood's Sarsaparilla, for instance, at a fraction less than a wholesale house will sell it for by the dozen. When the would-be purchaser calls for a bottle, he is met with the information, very adroitly presented, and with every appearance of disinterestedness, that they have another sarsaparilla that is very much better, and is sold at about the same price. Should the customer show unwillingness to buy the substituted article, every effort is made to dissuade him from buying the thing advertised, and, unless he be a person determined to get what he wants or nothing, he will be apt to leave the store with something else than the article he intended to buy. As a spur to the clerks to exert their utmost cunning in effecting sales of these substitute preparations, a commission is allowed them on all such sales, but on no other. It is stated that one cut store in this city will not retain a salesman who cannot succeed in selling from one-half to one-third as many of their own preparations as of those of which are advertised. In most businesses the proprietors advertise goods which they wish to sell, but in the drug business not one of them that advertises patent medicines at cut rates wants to sell the articles advertised, with the exception noted below. The fact that these people industriously advertise popular remedies, spending large amounts of money to do it, and then engage clerks for the very purpose of not selling them shows that there is a "nigger in the fence" somewhere.

The practice of having one or two articles as leaders, selling them at about cost price, obtains in many kinds of business, both wholesale and retail, the total volume of sales of such articles being inconsiderable as compared with the rest of the trade. But in retail drug stores the number of sales at cut rates and the aggregate volume of business done in them is very large as compared with the total sales, comprising from one-third to one-half of the whole, according to the locality and character of the business done. Under these circumstances, the incidental sales of other goods and the general increase in business resulting from cut-rate advertising are not sufficient to make the business remunerative without some other source of profit. This is found in their own proprietary preparations which they manage to sell in place of those which they advertise. In other words, the whole success of that method of doing business depends upon substitution, substitution, substitution, all along the line.

Much adroitness is shown in advertising these goods, so that the public are led to believe that their own preparations are not their own but somebody else's. They scarcely ever (if ever) bear the name of the cutter, but are often marked with the name of some fictitious firm in a far distant city. Hence we find "Black's Cherry Pectoral, manufactured by the Black Chemical Company, New York," or "Barker's Sarsaparilla, made by Barker & Co., New Orleans," etc. The advertisements read something like this:

Hood's Sarsaparilla	.65c.
Hood's Pills	.15c.
Ayer's Sarsaparilla	.65c.
Barker's Sarsaparilla	.70c.
Ayer's Cherry Pectoral..................	.65c.

regular price, $1.00, and so on. By strenuous efforts to sell Black's Pectoral and Barker's Sarsaparilla, and equally strenuous efforts not to sell the others, they make sufficient sales on preparations that yield a very large profit to "even up" the day's business. How long will the public be gulled this way?

But there are other ways, not generally considered reputable, by which those people make cutting remunerative. In some cases a physician is engaged to prescribe gratuitously for all comers who may desire his advice, or some glib-tongued druggist, having no shadow of qualification to act as a physician, does the prescribing himself. Of course, medicines so prescribed are always charged for pretty stiffly. There are many other ways in which the enterprising druggist manages to keep even with the world.

From what has been said it is evident that if people only knew the inside workings of these establishments they would be very much on their guard in dealing with them. The effect of all this advertising and cutting has been to create a feeling in the minds of the public that the average druggist is an extortioner, and that goods can be had in a drug store for almost any price they may choose to offer.

Instead of competition having benefited the public by securing to them better goods at reasonable prices, the result has been that they are now supplied with poorer goods, though generally at lower prices. The reputable pharmacist who sells only genuine goods finds himself compelled to meet prices that are made by those who sell cheaper or imitation goods, the public, unfortunately, in the majority of cases being usually unable to discriminate, because they know nothing of the value of most of the things the druggist sells.

When ladies buy dry goods or men hardware, they have an approximate idea at least of the value of the articles they are purchasing. The same persons having a prescription compounded, or buying drugs and medicines, are quite unable to determine, even approximately, the value of the article supplied them. Herein is the opportunity for the unscrupulous druggist, who, in most cases, turns cutter that he may have the larger scope for his questionable transactions.

WOMEN AS PHARMACISTS.

By H. D. DIETRICH.

[Very much has been said in favor of opening the field of pharmacy for cultivation by the gentler sex. Woman is making herself very welcome in this field, but there are some who do not think it a suitable sphere for her activity. It is but fair to give this other side a chance to present its objections. The writer of the following is one of the objectors, and we print his paper read at the last meeting of the Washington State Pharmaceutical Association.—Ed. Era.]

When this subject is announced I am certain to be accused of having selected for my text one which is threadbare, worn down to the lining and ragged at the edges, and I confess I do not hope to advance any new ideas or make any startling suggestions, but since the first day—unfortunate day it was—when I declared my allegiance as a Knight of the Mortar and Pestle, I have wanted to express myself on this subject, and in all these years I have had no more golden opportunity than this.

In a certain pharmaceutical journal there recently appeared an article with the same title as the one I have announced. It was written by a Miss ——, and it was evident from its tone that the fair writer was meeting, and, let us hope, surmounting, many and serious obstacles to the attainment of a full realization of her ambition to be a "pill-roller."

I regret you have not all read the article referred to, but I shall endeavor to have you know what was said therein by my references to the same.

I take direct exception to several statements made by this writer, and in some of these exceptions I believe there exists excellent argument as to why women are not, as a class, fitted for the duties and requirements of the pharmacist.

In the first place, while the statement that "statistics show that the great majority of wage-earning women have others dependent upon them for support," may go unquestioned, it can have but little, if any, bearing upon an argument in this instance—for statistics will not show that women who desire to become pharmacists are, even in the majority of cases, forced to wage-earning that they may provide food and clothing for others. On the contrary, the years of unremunerative apprenticeship which are as unavoidable as they are necessary, and the expense of acquiring an adequate pharmaceutical education, make it incumbent upon one to have some means for existence. Neither can the laudable ambition to be possessed of the proverbial corner drug store be gratified from the earnings of the drug clerk. True, there are a few such instances on record, but in the great majority of cases all this is clearly contemplated when the start is made. Hence, the argument that the ranks of pharmacy should be open to women, that an additional means of wage-earning for the support of others might be created, is a weak one. When the unfortunate necessity for wage-earning by women exists, there is no individual entitled to greater encouragement, assistance or respect, but, looking at it from an unprejudiced standpoint, one cannot but admit that pharmacy, in the abstract, does not provide a means of existence for some years after it is entered upon; and I might add that there are but comparatively few male apprentices to the drug business who contemplate providing for the existence of others, until such time in the future, when, having completed their studies and entered upon the enjoyment of the large (?) salaries paid their kind, they create family obligations with new mouths to feed annually.

Continuing the argument, and conceding that the average woman who enters upon the study and learning of pharmacy does not do so from a necessity of wage-earning, I cannot but utter a word of warning. The ambition of the average woman is granted to be to acquire all the accomplishments possible, both useful and ornamental, to enjoy the sweets of life, to command the homage of man and the world and to eventually "marry some good fellow and be happy ever afterward." To become a pharmacist, woman must disentangle herself considerably from the "poetry of life," and to say that she must get down to the "stern realities of life" when she takes up the profession of pharmacy is but expressing it mildly.

The writer of the article referred to asks that "the world recognize the fact that woman is compelled to seek employment side by side with man and that it give her the same chance and consideration that it shows to him." Be it so, by all means, and if women will persist in becoming pharmacists then let them do so "side by side" with men. Let them begin at the age of "sweet sixteen" or earlier to assume the duties of the drug apprentice—to sweep and dust the store, clean the windows, scrub the sidewalks, carry the coal, chop the wood, run the errands, hammer the vanilla bean for four weary hours, take a twenty-pound shovel and mix the horse and cattle powder; and an ax to break up into salable shape the caustic soda, charge the soda fountain, yank the boxes up and down the cellar steps and withal begin the day's work at 6:30 A. M., only to end it after sixteen or eighteen hours of work "that is work," and then either walk to her home a long way off or seek for rest on a cot in a dingy room either back of or above the store. Ye Gods, this is serving an apprenticeship "side by side" with man, and I will leave it to ninety-nine druggists of every hundred who have served an apprenticeship whether this picture is overdrawn or not.

Oh, no, such an apprenticeship is not the kind woman is seeking, and the man who would require it of a beautiful little woman would be justly termed a brute. What woman wants is a special sort of an apprenticeship—one arranged for her benefit. But this work must be done and if not by the "lady" apprentice then either by the proprietor, his right bower or by a second and probably otherwise unnecessary adjunct in the shape of the small boy.

The fair writer quoted concedes that to be a successful pharmacist woman must be unusually well and strong—able to stand long hours and a great deal of drudgery, but women who aspire to become pharmacists are seldom built that way.

Woman as a pharmacist is a beautiful picture, my friends, but as an apprentice to pill-rolling and a dead-sure thing it don't go, and I would ask here whether in the vocabulary of woman there is a language sufficiently expressive for use when a little "pillulet," which is being carefully and lovingly rolled between the fingers drops to the floor and rolls out of sight under the prescription counter, or when a prescription for sixty capsules or twenty-four suppositories is presented at five minutes before twelve, just as you are about to escape for the last car? I fear not. If woman actually desires to be a druggist, then, by all means, let it be as suggested by this writer, "side by side" with man. That alone will cure many a woman of her ambition in this direction.

I do not want to be misunderstood in this matter. For woman I have the most profound admiration; for woman I would readily yield every point of vantage, and believe me, it is solely because of my undying love for woman that I would raise my voice against her submitting to the indignities heaped not only upon the average apprentice, but the matured, full-grown, all-wool-and-a-yard-wide drug clerk as well. I would save her the aching heart, the weary body, the tired head and the soiled, calloused hands of the drug clerk, and all these are inevitable; for to slightly paraphrase the language of the poet, "He (or she) who enters here leaves all hope behind."

CO-OPERATIVE MANUFACTURING.

The Empire State Drug Company has just entered the field with a line of medicines of its own manufacture. The company is one of several which represent a tendency on the part of the retail druggists to emancipate themselves from gratuitous services to proprietors and the public. All over the English speaking world to-day the sale of well known proprietary articles at cut prices as an advertising feature prevails. In England the evil has gone to such lengths that manufacturers of proprietary articles themselves have seen the importance of preventing it, and not a few of them advertise to druggists their determination to cut off the supplies of the cutter. In this country for a long time it was customary for many druggists to manufacture proprietary articles of their own, on which there was a living profit, and to encourage their sale as much as possible.

The co-operative idea is said to have originated in Canada, where one company, the Canadian Chemists and Druggists, of Hamilton, Ontario, has been in operation for almost four years, and is said to have paid a dividend of 8 per cent., besides accumulating a surplus of 75 per cent. of its capital stock. All readers of the Era are aware that these companies are now common in this country, and that several claim to be successful in operation.

The New York enterprise originated in Buffalo, where some of the most enterprising pharmacists in this State reside. A number of them got together and decided that instead of each manufacturing his own goods, it would be mutually advantageous for all to combine, and also to take in those retailers who are not in a position for such manufacturing on their own account. The plan being fully outlined in accordance with that prevailing in other localities, was presented to the Erie County Pharmaceutical Association last spring, and fully endorsed by that body as follows:

> "That a Company be formed under the laws of the State of New York, to manufacture and deal in proprietary medicines, toilet articles and druggists' sundries. That said company be composed entirely of retail druggists. That the stock of said Company will consist of such amount of capital as the Board of Directors shall deem best, and that this stock shall be divided into shares of $10.00 each, and that each stockholder shall be limited to not exceed ten shares.
>
> That the stock of this Company shall not be transferable, except by a vote of the Directors, and no one shall hold stock unless he is actively engaged in the retail drug business.
>
> If a stockholder is retiring from the drug business the Company will take the shares of stock held by him at par value, and the said stock will become part of the assets of the Company."

It is distinctly stated that one of the advantages to be derived from participation in this enterprise is that the stockholders will not be allowed to supply any of the goods at wholesale unless the buyer is a stockholder himself; any violation of this rule to be punished by forfeiture of stock and the taking of his name from the roll.

On July 22 the certificate of incorporation was filed with the Secretary of State, at Albany, the following board of directors being named: Thomas Stoddart, president; Charles A. Osmun, first vice-president; Willis G. Gregory, second vice-president; George Reimann, treasurer; Joseph Schnell, Neil McEachren, Thomas W. Dalton, Horace P. Hayes, Robert K. Smither, James A. Lockie, Plin S. McArthur, John Tilma, and Jabez H. Peterson.

The stock of the company is $50,000, to be sold in shares of $10 each, no druggist being permitted to hold more than three shares. About the middle of last July blanks for stock were generally circulated throughout the trade, in which the signers agreed not to cut the prices on the articles manufactured by the company, and that they would not sell their stock to persons who were not retail druggists within the State of New York, and then only with the approval of the Board of Directors. They agree also that a violation of any of the provisions of the agreement should be a first lien on the shares of the stock in favor of the corporation. The heirs, representatives and assigns of the signers were also bound to the same agreement. The work of organizing the company has been quite successful, and the first lot of goods, it is understood, are now on the point of being sent out by the manufacturing company.

Thos. Stoddart.

Thomas Stoddart, president of the company, and one of the original promoters of the enterprise, has been connected with the drug business since he was a boy. He is one of the founders of the Buffalo firm of Stoddart Bros., which began business at 84 Seneca street in 1877, and helped to organize the Erie County Association, and has served as its president. He helped secure the passage of the Erie County pharmacy laws, which are regarded by the druggists of that county as the most nearly perfect in existence anywhere. In everything that he has undertaken, Mr. Stoddart has met with signal success.

C. A. Osmun.

The president of the company being a Buffalo man, it was no more than fitting that the vice-president should be chosen from the other end of the State, and Charles Alden Osmun, of New York City, was selected for this office. Mr. Osmun requires no introduction to the pharmacists of this locality, having been twenty-six years in his present location on Seventh avenue. He is eight years older than Mr. Stoddart, having been born at Hackettstown, N. J., fifty-one years ago. He began his business career with Hegeman & Co., in this city, in 1862. He is actively interested in many enterprises for the benefit of pharmacy, among which may be mentioned the New York College of Pharmacy, the Interstate Retail Druggists' League, and the New York State Pharmaceutical Association.

The New England Pharmacal Company has been engaged in manufacturing a line of household remedies under the name of "Nepco," for some time past. Their annual meeting was held in Boston the middle of last June, F. M. Harris, of Worcester, occupying the chair, and F. W. Reeves, of Cambridge, acting as secretary. The officers elected at that meeting for the present year were Henry Canning, of Boston, treasurer; F. W. Reeves, of Cambridge, secretary; W. F. Greene, of Dorchester, assistant secretary; and a long list of well known druggists from all over New England as directors.

The New Jersey Home Laboratory Association is a similar organization which has started within the last few months. It consists principally of Newark druggists, and they have for some time now been selling a family remedy which they call "Manolea." They propose to create a demand for their goods by advertising. The officers of the association are: F. F. Crissey, president; L. L. Staehle, vice-president; Charles Wuensch, secretary; F. Bruguier, treasurer. The board of directors are as follows: C. W. Roeber, A. B. Crooks, F. B. Meeker, R. Staebler, T. P. Van Ness, S. Epstein, H. Weller and A. F. Burckhardt. The members of the company are very much in earnest and expect to put out a full line of medicines in the near future. A candid druggist who is eminently favorable to the scheme told the writer that "Manolea" was not easily sold. He said he thought a mistake had been made in giving so small a package. He believes that most people would prefer to buy a well known proprietary remedy, which this is supposed to resemble, because they can get just as much for their money, if not more.

Emil Thiele.

The most successful association of this class, and one which promises to be a nucleus about which many neighboring associations will collect, is that organized in Chicago. Its promotors say that its history really begins with that of the Chicago Pharmacal Company, organized a decade ago to buy in quantity for distribution, in order to get advantage of the lowest wholesale terms. The company was absorbed by the United States Pharmacal Company, as the Chicago co-operative concern is called. This was suggested at the Illinois State Pharmaceutical Association meeting in 1894, by President Emil Thiele, and a committee was appointed which reported favorably upon the suggestion at the next annual meeting in October, 1895, and subscription books were opened. A year ago the plan was known to be successful, so far as the number of subscriptions was concerned, and the annual meeting was held Jan. 28 of the present year, at which the company was fully organized. The first lot of goods was gotten out in April, and President Thiele is authority for the statement that there has been a steady and marked improvement in sales from that time to this. The most noteworthy piece of information connected with the United States Pharmacal Company is that on September 4, at the St. Louis College of Pharmacy, the St. Louis Apothecaries' Association, which had contemplated forming a manufacturing organization of their own, decided instead to join the United States Pharmacal Company. This was promised on a year's trial. If, at the expiration of that time the Missouri stockholders desire to withdraw, they will be permitted to do so without loss to themselves. Every druggist in Missouri received a circular after the meeting soliciting subscriptions.

For some time the Minneapolis druggists have been conducting their own manufacturing, and at the last meeting of the New York State Pharmaceutical Association, one of their members who was present as a delegate reported that they were doing a very satisfactory business.

Wisconsin also has an association, with headquarters at Milwaukee, originated last March, with C. Widule as president, and the latest news from that section is that they are considering a proposition from the United States Pharmacal Company to join that organization. The representatives of the United States Pharmacal Company are also making progress in Louisville and other cities. Word comes from San Francisco that a similar organization is being started there.

Another organization on similar lines is the Pharmacists' Cigar Company, of Detroit. Nearly four hundred druggists comprise this organization, each shareholder paying $20 for two shares of stock. All members buy direct, without solicitation, and pay cash. The cigars are sold at low prices, so that each member receives his dividend at once. Cigars are sold at exactly the same rates in larger or smaller quantities, so that large buyers have no advantage over their less fortunate rivals. O. H. Grunow is president of the association. A circular issued by the company shows the profits made by thirty-three representative members to range from $5.30 to $30.90 actually saved by each member over and above his regular retail profits. They are selling their goods in Ohio, Indiana and Illinois. C. N. Anderson, the secretary-treasurer of the company, deserves prominent mention for his services to this cause.

It will be seen that the tendency to co-operative manufacturing is of very recent date, as most of the companies now existing have sprung up within a year. They represent the protest of the retail druggist against a certain injustice from which he undoubtedly suffers, under the unrestricted competition of department stores and other cutters. It is too soon to make any prediction as to their success or failure, whether they will all be absorbed by one aggressive company, or whether a more conciliatory policy on the part of manufacturers of proprietary articles will render their further extension unnecessary. It is certain, however, that unless the managers of these companies are prepared to devote their entire time to extending the business of the companies, and a large percentage of the profits to advertising, in order to make a market for their goods, they can never compete with the trained business men who are at the heads of the various proprietary concerns. The good will of the retail druggist, however, is a factor of tremendous importance in any pharmaceutical business, and this these companies undoubtedly have to a considerable degree.

PEARL-COATING PILLS.—At a meeting of the Edinburgh Chemists', Assistants' and Apprentices' Association, Mr. James Gould offered some advice upon this topic. He said that after being made the pills should be allowed to dry for a day or two. They should then receive two coats of varnish (either tolu 1 dram and ether 1 ounce, or sandarac 1 part and absolute alcohol 1 part). This prevents pitting and the exudation of essential oil, which colors the coating. The apparatus for coating consists of three covered pots, a sieve, and a marble slab. The coating powder is French chalk and starch (1 dram to 1 ounce), which is whiter. A small quantity of Martindale's mucilage of tragacanth (4 grains to 1 ounce with 1 dram rectified spirits alcohol) is placed in one of the covered pots, and the pills are evenly coated with this by shaking them up in the pot. They are then transferred to a covered pot containing the chalk and rotated for a minute or so. Then they are turned into the sieve, which removes excess of chalk. They are then placed upon the slab and carefully rolled under the palm of the hand gently, and gradually increasing the pressure as the coating dries. They are next turned into a clean pot and rotated gently so as to make the coating adhere more firmly. The process is then repeated, two coatings being sufficient. To give the pills the high polish so much desired they should be allowed to stand for a day to dry; then vigorously rotate them for some time in a clean, smooth-covered pot. For prescription-pills the same perfect finish cannot be obtained, but with a little practice two or three dozen pills can be finished satisfactorily in about fifteen minutes. Pink pills are easily made by adding a little carmine to the chalk. (Ch. & Dr.)

QUESTION BOX

The object of this department is to furnish our subscribers with reliable and tried formulas and to discuss questions relating to practical pharmacy, prescription work, dispensing difficulties, etc.

Requests for information are not acknowledged by mail and ANONYMOUS COMMUNICATIONS RECEIVE NO ATTENTION

In Chart. Decem Pone.

(W. S. D.) "In chart. decem pone" is read: "Place (or put) in ten papers."

Preparation of Lavender and Ether.

(J. G. N.) Please repeat your query giving us fuller information about what you want, and we will try and help you out.

Thiersch's Solution.

(R. I. H.)

Salicylic acid	2 parts
Boracic acid	12 parts
Water	1000 parts

Egg Coloring For Cake.

(G. J. S.) According to Dick, the egg-coloring used by bakers for cake is turmeric. About ½ dram is added to each pound of baking powder.

Tincture or Liniment for Internal or External Use.

(F. H. M.) We cannot give the formula for the proprietary article. Formulas for preparations used similarly appear under the above title, this journal, Dec. 17, 1896, page 793.

Pineoline.

(W. A. J.) Pineoline is a proprietary remedy which the manufacturers state to be "a delightful and efficacious ointment prepared from the ethereal extract of the Needle of the Pine (Pinus Pumilio) growing in the Black Forest of Germany." We cannot give the formula.

Hemorrhage from Tooth Extraction.

(J. K.) The Era Formulary gives this formula:

Chloroform	1 dram
Tannic acid	30 grains
Menthol	30 grains
Tincture krameria	1 fl. ounce
Distilled water	1 pint

The hemorrhage may sometimes be stopped by inserting a plug of absorbent cotton covered with powdered tannin or saturated with other astringent.

To Restore Brightness to Window Glass.

(W. S. R.) The dullness or smokiness of window glass which cannot be removed by washing or scrubbing, is due to a gradual decomposition of the glass and the solution of the sodium or potassium salts contained in it by the carbonic acid of the atmosphere. Such glass can generally be restored to a fairly bright condition by washing with dilute hydrochloric acid, and afterwards rubbing with moistened chalk or whiting.

Books on Flavoring Extracts.

(R. C. B.) There is no one book devoted exclusively to this subject. The Era Formulary contains the largest and best collection of formulas under this heading with which we are acquainted. Dubelle's "Soda Fountain Requisites" is another work which contains many formulas for flavoring extracts particularly adapted to the manufacture of fountain syrups. A small work on the subject is Harrop's "Monograph on Flavoring Extracts." In addition to these works you may be able to gather considerable information from Brannt's "Treatise on Animal and Vegetable Fats and Oils." Part II. of this book is devoted entirely to the consideration of essential oils, their manufacture, etc., giving physical and chemical properties, uses, etc. Many practical rules are also given for testing these oils.

Oil of Persicot.

(A. E. H.) Persicot or persecot is a kind of cordial made of the kernels of apricots, nectarines, and the like with refined spirits. Oil of persicot is a compound or essence listed by various manufacturers for the preparation of this cordial. The formula probably varies with the idea of the manufacturer, the following, however, being a typical preparation:

Oil of bitter almond	940 grams
Oil of cloves	30 grams
Oil of cinnamon	30 grams

Remedy to Cauterize a Wound.

(J. K.) There is a number of substances used to destroy tissues. The following are some of the more important used by surgeons: Bromine, chromic acid, mercuric nitrate solution, potassa, sulphuric acid, zinc chloride and silver nitrate. Exsiccated alum, dried sulphate of zinc and potassa with lime, are also caustics, but their action is somewhat circumscribed. The first five mentioned are generally classified as penetrating in their action. Heat may also be properly denominated a caustic. The treatment of a wound requiring the use of a powerful caustic should be placed in the hands of a physician.

Precipitation in Syrup of Ipecac.

(R. F. T.) By using the official fluid extract of ipecac and carrying out in detail the pharmacopœial process a syrup may be obtained which will remain transparent for a considerable length of time. With the commercial fluid extracts precipitation will nearly always occur. It may be generally prevented, however, by allowing the fluid extract after dilution in the official process for making the syrup to stand two or three days before filtering. In this way the pectinous principles likely to appear in the finished syrup as a flocculent precipitate are removed. The present official formulas for fluid extract of ipecac and syrup of ipecac differ considerably from those of the Pharmacopœia of 1880.

Question of Dose.

(W. C. T.) received this prescription:

℞

Antipyrin	gr vi.
Pulvis	xij.

Sig. I om. hora, directed.

The principal criticism against this prescription is that of dose, for the dispenser cannot positively decide whether the prescriber wishes 6 grains of antipyrin divided into 12 powders or 12 powders each containing 6 grains of antipyrin. It is probable, however, that he wishes powders each containing 6 grains. The directions to the patient are an admixture of abbreviated Latin and English and meaning, no doubt, that one should be given every hour as directed.

German Prescription Again.

Alfred Lange, Jersey City Heights, N. J., takes exceptions to the various translations of the German prescription appearing in the December 17 issue of this journal. He thinks the prescription reads:

℞

Infus. rhei	6/150.0
Syr. cort. aur	30.0

M. S., etc.

A. F. Bonney, M. D., Ph. G., B. A., a California druggist, who, by the way, seems to have a penchant himself for abbreviations, says: "Any druggist who will fill or try to fill such a prescription should be sent to an asylum. The M. D.! Just kill him."

Solvent to Remove Varnish.

(Phm. B.) The solvents employed to remove varnish are solution of potassa, soda, oil of turpentine, alcohol, stronger water of ammonia, naphtha, ether, etc. An old painter tells us that it is frequently useful, before attempting to remove a coat of old varnish, to give the work a new coating, always, however, previously wiping off all dust and dirt with a little soap or a damp sponge. He says this cleaning operation should be the very first operation in all cases. When the new varnish is dry, it will, on applying a solvent, be found to have attached itself to the oil of the old, so both may be removed without difficulty, whereas, without the preliminary coat much friction may become necessary. Hard varnishes will require a mixture of alcohol and spirit of turpentine with potassium carbonate. Every time this mixture is used it is to be well shaken; a little is then poured on the paint or poured on a piece of flannel, and the varnish rubbed therewith. This operation is to be repeated over the whole of the varnish, frequently changing the piece of flannel.

In the case of an intractable varnished surface a box of impalpable pumice stone powder is a useful article to have at hand. To use this powder, dip the flat part of a large cork in the powder, and rub the varnished surface with it in a series of interalacing circles, brushing off the powdered varnish from time to time and finishing one part of the surface before beginning to work on the next. When the dust assumes a whitish appearance it is time to leave off using more pumice powder on that part.

Elixir of Compound Powder of Pepsin with Iron, Quinine and Strychnine.

(S. S. L.) Try the following, modeled after one of the National Formulary preparations:

Compound powder of pepsin, N. F.	512 grains
Phosphate of iron	64 grains
Quinine (alkaloid)	64 grains
Strychnine (alkaloid)	1 grain
Alcohol	4 fl. ounces
Water	2 fl. ounces
Aromatic elixir, enough to make	1 pint

Dissolve the alkaloids in the alcohol and add to eight ounces of aromatic elixir in which the compound powder of pepsin has been dissolved; then dissolve the phosphate of iron in the water using heat, if necessary, and add to the previous mixture. Finally add enough aromatic elixir to make 1 pint.

Pick-Me-Up.

(Phm. B.) The following have been published:

(1)	Aromatic spirit of ammonia	½ dram
	Compound tincture lavender	½ dram
	Spirit of chloroform	15 minims
	Peppermint water, to make	1 ounce

For 1 dose:

(2)	Fluid extract coca	1 fl. dram
	Tincture capsicum	4 minims
	Tincture humulus	20 minims
	Spirit chloroform	15 minims
	Compound tincture cinchona	1 fl. dram
	Water to make	1 fl. ounce

For 1 dose:

(3)	Potassium bromide	20 grains
	Spirit chloroform	20 minims
	Compound tincture of gentian	10 minims
	Aromatic spirit ammonia	10 minims
	Peppermint water to make	2 fl. ounces
(4)	Essence of ginger	10 minims
	Aromatic spirit ammonia	½ dram
	Tincture gentian	1½ drams
	Compound tincture of cardamoms	½ ounce
	Syrup	¼ ounce
	Chloroform water to	2 ounces

Mix and take as a draught.

Pick-Me-Up Bitters.

(5)	Spirit chloroform	2 ounces
	Aromatic spirit ammonia	5 ounces
	Tincture cascarilla	5 ounces
	Glycerin	5 ounces
	Compound tincture of gentian to	30 ounces

Dose: 1 to 4 drams.

Purification of Water.

(J. K.) Sodium fluoride is used to considerable extent for the purification of water. In a paper read before the Wisconsin Pharmaceutical Association about a year ago, A. Wangeman claimed that when it was added to water it was superior to alum for removing impurities, calcium and magnesium salts, organic matter and noxious bacteria. He also recommended this treatment for water tainted with sewage, claiming that it was the only substance known which would actually prevent the formation of scales in boilers. Its action is based on the fact that it precipitates the alkaline earths in the form of an innocuous soft mud which does not adhere to the boiler. For this purpose the amount varies with the composition of the water, from an ounce to each 1,000 gallons upward being necessary.

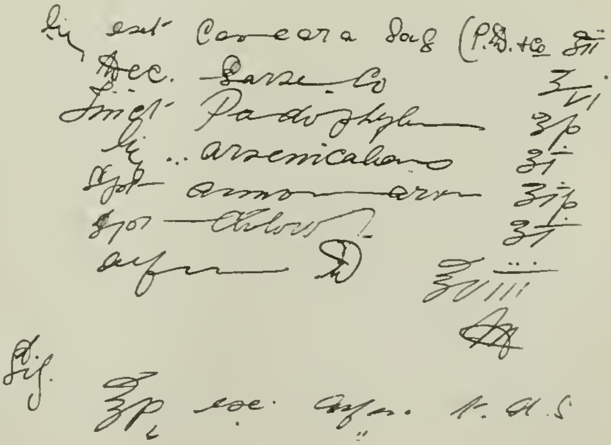
Calcium permanganate has also been employed as a chemical means of purifying drinking water and it is claimed (Bordas and Girard, Comptes. rend.) to be a more powerful oxidizing agent than potassium permanganate and has the further advantage of not contaminating the water with mineral matter. The carbonic acid produced during the oxidation liberates permanganic acid from the salt, and so quickens the destruction of the rest of the organic matter. In practice they say it is necessary to employ an excess of permanganate, which is removed by the lower oxides of manganese, by which it is transformed into manganese dioxide. The following reactions take place: (1) Decomposition of calcium permanganate in presence of organic matter, with formation of calcium carbonate and manganese oxides; (2) Oxidation in the mixture of lower manganese oxides and carbon (added to agglomerate them) at the expense of the permanganate; (3) slow reduction of the manganese peroxides thus formed by organic matter or by the carbon. These investigators reported that waters which were colored after the above treatment, became colorless when exposed to air for 24 hours, depositing a brown gelatinous substance, a manganous manganic oxide, which appears to be soluble when first formed; the water is then free from organic matter, and contains only very little calcium carbonate and traces of hydrogen peroxide.

Muddy water is said to be clarified in the following manner: Dip a filtering paper in a solution of chloride of iron and another paper in a solution of carbonate of sodium. Dry both. Place a piece of the chloride of iron paper in the water to be clarified, and then a piece of the carbonate of sodium paper; a precipitate of carbonate of iron is formed which clarifies the water. Finally filter through a funnel, the neck of which is filled with pieces of sponge.

In this journal, July 1, 1893, page 11, were described several methods for purifying drinking water in which iron filings, alum, ferrous sulphate, etc., were employed.

Obscure Prescription.

(W. C. T.) submits the following prescription: He makes no comments on the incompatibilities, but he thinks the latter part of the prescription and the directions are somewhat obscure:



℞ ext Cascara Sag (P.D. & Co) ℥ii
Dec. Sarsæ Co ℥vi
Tinct Podophyllin ʒss
Liq. arsenicalis ʒi
Spt ammon arom ʒiss
Syr Chloral ʒi
Aqua ad ℥viii
M.
Sig.
ʒss ex. aq. t. d. s.

The criticisms are well taken. We are of the opinion, however, that the last ingredient is intended for water (aquæ) and the line in which it appears reads "aquæ ad. ℥viij." or water up to eight ounces. This opinion is supported by comparing aquæ as here written, with the same word as written in the directions to the patient. The directions may be read (℥ss. ex. aqua t. d. s. (ter die sumendus)) ½ ounce in water to be taken three times a day. The wisdom of combining Fowler's solution and aromatic spirit of ammonia in prescriptions of this character is not apparent. We submit the prescription to our readers for further criticism and skill at interpretation.

Almond Cream.

(H. & E.) Almond mixture is very unstable, and, as a rule, is seldom employed in toilet preparations. Oil of bitter almond is, however, generally added to give the characteristic odor. Try the following:

Ointment of rose water	5	parts
Oil sweet almonds	5	parts
Glycerine	5	parts
Boric acid	5	parts
Solution soda, U. S. P.	12	parts
Mucilage quince seed (2 drachms to 1 pint)	25	parts
Water, sufficient to make	200	parts

Oil bitter almond;

Oil rose, of each, sufficient to perfume.

Heat the ointment, oil and solution of soda together, stirring constantly until an emulsion is formed; then warm together the glycerine, acid, mucilage, and about 150 parts of water; mix with the emulsion, stir until cold, and make up to 200 parts by adding more water. Lastly add the perfume.

Askinson gives this formula: First prepare an almond cream, as follows:

Melt ten pounds of purified lard in an enameled iron pot or a porcelain vessel, and while increasing the temperature add little by little five pounds of potash lye of 25 per cent. strength, stirring all the time with a broad spatula. When fat and lye have become a uniform mass, 2¾ to 3½ ounces of alcohol is gradually added, whereby the mixture acquires a translucent, crystalline appearance. Before the alcohol is added three-fourths to one ounce of oil of bitter almond is dissolved in it. The soapy mass thus obtained is called "almond cream" (crême d'amandes) and may be used alone for washing.

To prepare amandine or almond emulsion:

Expressed oil of almonds	10	pounds
Almond cream	3½	ounces
Oil of bergamot	1	ounce
Oil of bitter almond	1½	ounce
Oil of lemon	150	grains
Oil of cloves	150	grains
Oil of mace	150	grains
Water	1¾	ounces
Sugar	3½	ounces

In the manufacture the following rules should be observed:

Effect the mixture in a cool room, the cellar in summer, a fireless room in winter. Mix the ingredients in a shallow, smooth vessel, best a large porcelain dish, using a very broad, flat stirrer with several holes. The sugar is first dissolved in the water and intimately mixed with the almond cream. The essential oils are dissolved in the almond oil contained in a vessel provided with a stopcock. The oil is first allowed to run into the dish in a moderate stream under continual stirring. The mass soon grows viscid, and toward the end of the operation the flow of oil must be carefully restricted so that the quantity admitted can be at once completely mixed with the contents of the dish. Well made amandine must be rather consistent and white, and should not be translucent. If translucency or an oily appearance is observed during the mixture, the flow of oil must be at once checked or enough almond cream must be added to restore the white appearance, under active stirring. As amandine is very liable to decompose, it must be immediately filled into vessels in which it is to be kept, and the latter, closed air-tight, should be preserved in a cool place. By adding three-quarters ounce of salicylic acid, amandine may be made quite permanent so that it can be kept unchanged even in a warm place.

NEW REMEDIES.

ALSOL.—An aceto-tartrate of aluminum.

COCAPYRINE.—A mixture of cocaine hydrochloride and antipyrine.

MOLLOSIN.—A mixture of yellow wax 1 p. and liquid petrolatum 4 p.

PILIN.—A hydroalcoholic fluid, containing benzoic acid, colored red and perfumed.

SALICOL.—A toilet water containing methyl alcohol, salicylic acid and oil of wintergreen.

BORALID.—A mixture of equal parts of antifebrin and boric acid, used in treatment of eczema.

KATHAROL.—A preparation of hydrogen peroxide, which sometimes contains 30 per cent. alcohol.

GLYBOLID.—A mixture of equal parts of boratid (equal parts of acetanilid and boric acid) and glycerin.

FERROSOL.—A double saccharate of ferric oxide with sodium chloride which contains 0.77 per cent. of iron. It is claimed to be readily assimilable.

NORMAL-ANTI-HYDRORRHIN.—A compound containing borosalicylic ester, 10 p.; ethyl chloride, 5 p.; spirits of rosemary, 100 p.; recommended for perspiring feet.

COLCHICIN-SALICYLATE.—A solution of 0.25 gram of colchicin in 0.2 gram of pure methyl salicylate (obtained from the oil of Betula lenta), dispensed in capsules.

LIQUOR CEREBRI STERILIZATUS (Cerebrinin).—A fluid extract prepared from fresh calf brains; to be used in treatment of neurasthenia, chorea and mental disturbances.

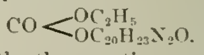
MYDROL. — (Iodo-methyl-phenyl-pyrazol). Used to dilate the pupil of the eye without causing any of the discomforts or irritation, the effect dying off within twenty-four hours.

NICOTIANA SOAP.—A medicated soap which contains about 10 per cent. of extract of tobacco (0.42 per cent of nicotin), and is used in treatment of all skin diseases of parasitic origin.

IMIDIOD.—A crystalline antiseptic obtained by heating a solution of para-ethoxy-phenyl-succinimid, potassium iodide and iodine. Imidiod melts at 175° C., and is used as an antiseptic dusting powder.

COCAINE STEARATE ($C_{11}H_{21}NO_4.C_{17}H_{35}COOH$).—Obtained by double decomposition between cocaine hydrochloride and sodium stearate. Used as oleaginous application 0.5 to 50 of expressed oil of almond; in suppositories, each one (2.25 gm.) containing 0.02 gm; in ointment, from 0.5 to 50 of petrolatum.

EUCHININ.—An ethyl carbonic ester of quinine of the following formula



$CO\begin{matrix}\diagup OC_2H_5\\ \diagdown OC_{20}H_{23}N_2O.\end{matrix}$

This new derivative possesses all the therapeutic properties of quinine without any of its disturbing effects, as bitter taste, disturbance of appetite, nausea, singing in the ears, etc. Euchinin is obtained by action of ethyl-chloro-carbonate on quinine, forming white needles, melting at 95° C.; slightly soluble in water, readily so in alcohol, ether and chloroform. Its solution has an alkaline reaction and forms well defined crystalline compounds with acids; when dissolved in dilute nitric or sulphuric acid the solution is strongly fluorescent. It gives the thalleioquin test of quinine, but not the herapathit reaction. The base itself (euchinin) is entirely tasteless, but is best administered in sherry, milk or cacao in powder form. The hydrochloride of euchinin is very soluble, while the sulphate is but slightly and the tannate insoluble in water.

THE PHARMACEUTICAL ERA

[*WEEKLY.*]

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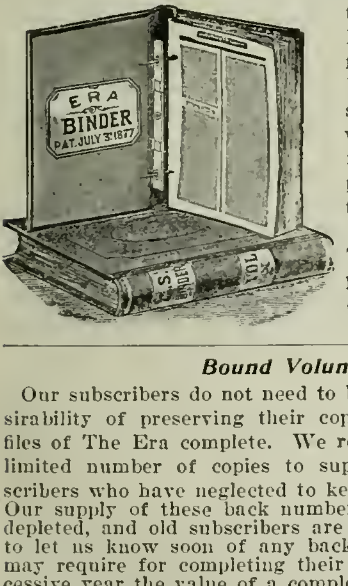

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Shorter Hours for Drug Clerks.

The New York Journal has taken up the cause of shorter hours for drug clerks. This ought to bring cheer to the hearts of Mr. John Gallagher and his adherents. The hope for the success of Mr. Gallagher's movement lies not especially in legislation, not in union, but in an appeal to the general public, and the best vehicle for such an appeal is the daily press. But it is to be remembered that one editorial is as powerless to convince the public on such a subject as one swallow is to make a summer. Mr. Gallagher and the friends of the movement should see to it that there is no let-up to the question's agitation in the newspapers.

In the editorial in which it calls attention to the New York and Brooklyn druggists who are working for shorter hours, the Journal says:

> "It is to be earnestly hoped that they will succeed, for no reform is more vitally connected with the general health and welfare. In the first place, no man who can be hired for the drug clerk's present pittance can be intelligent enough to compound the deadly drugs called for in physicians' prescriptions. When the man who is content to work for $12 a week has been on his feet busily engaged for fourteen or fifteen hours his intellect of necessity is clouded with sleep and weariness, and if he was dangerous before he is certain to work mischief now. * * *
>
> Physicians and druggists—some druggists—will say that many a death that has been certified to and seemed unavoidable has been the result of murder by incompetent and worn-out compounders of prescriptions. The druggists and the doctors "stand in" with one another; but that enough of them do leak out to cause trouble is shown by the organization in Brooklyn the other day of an association of druggists, whose chief, if not sole, object is to defend financially such of its members as may become accessories before the fact to just such murders."

As an argument to convince a public essentially selfish and holding the safety of its own skin beyond any and every other consideration, the first of these foregoing paragraphs has telling force. As a statement of fact it is open to criticism. Ben Harrison's much quoted remark that a "cheap coat makes a cheap man" is far more epigrammatic than axiomatic, and the assertion evidently founded on that remark that "no man who can be hired for the drug clerk's present pittance can be intelligent enough to compound the deadly drugs called for in physicians' prescriptions" is contradicted by the facts. Such a sentence is enough to make the drug clerks cry, "Save us from our friends!" Surely the Journal must know that before he can compound prescriptions the drug clerk must pass a most rigid examination. His passing this examination is proof positive of his intelligence; the Board of Pharmacy takes good care of the fools and dullards.

With regard to the latter paragraph quoted. How many fatalities or accidents occurring during the past year through the mishandling of drugs in prescriptions can the Journal bring up to support its charges of "murder by incompetent and worn-out compounders of prescriptions?" Very few, we fancy. It is not the public that needs protection; it is the drug clerk who asks for common justice, for common humanity.

But, if all this nonsense about drug clerks whose intellects are so "clouded with sleep and weariness" that they put arsenic instead of ice cream into the soda water, serves as a bugbear to frighten the ever-timid public into siding with those striving for shorter hours—why, it will be worth more to the overworked druggist than ordinary common-sense. For, we repeat, in the public lies salvation.

Retail Druggist Desire Free Alcohol.

The attempt has been made to influence legislation on the tax-free alcohol question by the assertion that the retail druggists do not want it. One special pleader and self-accredited "representative" goes so far as to say that he speaks for 30,000 retailers who are opposed to it. This representative has no authority to speak for any one but himself, and the statements he has made have been repeatedly proven not to represent fairly the sentiment of the trade. There are some druggists who do not favor the free alcohol proposition, but 30,000! nonsense. We don't believe any man can give the names of even 3,000 who do not want it.

The Era has asked the retail druggists of the United States to hand in their votes on the question, and they are doing it with a vengeance. Every mail is burdened with votes, and not even 1 per cent. is opposed to tax-free alcohol for manufacturing purposes.

Here are a few samples just as they run:

W. C. Hillard, Bristol, Conn.—I do most earnestly in my own behalf and in behalf of the six other drug firms of this town, protest against alcohol being "tax free to manufacturers," and not to the retail druggists. I have no time nor inclination to go into an argument at this time in relation to the matter. It would simply be as a great deal of our legislation is, unjust and unequal in its operation. Free to one, free to all. Senator Platt and Congressman Russell, of Connecticut, have evidently got into the clutches of the patent medicine men.

W. R. Cutler, Ionia, Mich.—For myself, I will say that I would be satisfied to have no free alcohol, but I am opposed to any discrimination in favor of large manufacturers. If large manufacturers are to have free alcohol, all druggists should have it also.

Nelson Hower, Mendon, Mich.—In regard to the question on alcohol in last Era, would say, I am in favor of free alcohol. I do not think the large manufacturers should have the benefit unless the retail druggists have the same.

T. D. Thomas, Lehighton, Pa.—By all means we should have free alcohol. It is one of the few things that has not declined in price. It is entirely too high, compared with other drugs, etc.

Hull & Stevens, Clinton, Conn.—We believe in tax free alcohol for the retailer, who is also a small scale manufacturer, as well as for the large manufacturers, and for use in the arts.

James Craig, Fort Washington, Pa.—That special witness who claimed to represent 30,000 retail druggists, etc., was simply an "ass," and didn't know what he was talking about.

S. S. Lanyon, Omaha, Neb.—You ask that each druggist give his views on free alcohol. Nearly all of the seventy druggists in this vicinity would certainly be opposed to it.

J. M. C. Bargar, Holland, N. Y.—I certainly desire tax free alcohol, that it may place me as a retailer and small manufacturer on an equal footing with the large user.

O. B. J. Halnes, Allentown, Pa.—Put in as many votes for me as possible. To have free alcohol would be a big source of relief to the almost ruined retail drug trade.

J. A. Settle, Waverly, Mo.—I desire tax free alcohol for manufacturers and retail dealers of alcoholic preparations.

Elmer E. Thrapp, Avilla, Ind.—If free alcohol can be made practical for small retailers, I want it; if not, I don't.

F. H. Huntley, West Troy, N. Y.—I am decidedly in favor of free alcohol, as you have inquired in your journal.

William Schapira, New York, N. Y.—I certainly am in favor of alcohol free of tax to the retail druggists.

J. H. Weber, Cascade, Ia.—Please enter me as an advocate of "free alcohol" for pharmaceutical use.

H. W. Hollon, Skaneateles, N. Y.—I am in favor of free alcohol for retail druggists.

An Important Legal Opinion.

We print in this issue a legal opinion concerning the extent to which American citizens may lawfully furnish the Cuban insurgents with medical supplies. The opinion, arrived at after the most painstaking and extended research, has been specially prepared for the Era. The author lays it down that the contribution of medical supplies to the Cuban cause by citizens of the United States is not illegal, provided such supplies are not furnished to an expedition fitted out within American boundaries, or to a vessel of war afloat within American waters.

Multiplication of Pharmacy Schools.

Druggists of Rhode Island, especially those who are members of the State Pharmaceutical Association, are interested in the proposition, recently made, to establish a school of pharmacy in that State. It is significant that while all seem to be in sympathy with the motive which undoubtedly prompted the proposition, a large proportion see little prospect of the venture proving a success. The views they advance in support of this opinion are reasonable and sound.

While colleges of pharmacy and the cause of pharmaceutical education in general have no warmer champion than the Era, we cannot but feel that the Rhode Island plan is ill advised and a mistake. It is one thing to say let us have a college of pharmacy, and a far different thing to establish one of the proper sort. What is needed is not more colleges, rather fewer but better ones. There are several little ones now which are no credit to the profession and whose discontinuance would be a decided benefit. The right kind of college requires an equipment which cannot be secured by the mere say-so of a few pharmacists. There must be a faculty of trained and experienced teachers, and they must be well paid. The good, reliable, able pharmacist is not necessarily a good teacher, and to depend upon such a source for the teaching staff is an egregious error. In every single instance where this experiment has been tried the college has proven weak, of inferior standard, making no progress, and all of this class are to-day either dying or dead.

Beside an adequate faculty, there is the financial problem to consider. Money makes the mare go, and the college of pharmacy must have at command a sufficiency of ways and means to further its work. An unendowed institution must have large classes, as its existence depends on the income from students' fees. There are less than 300 drug stores in the entire State of Rhode Island, and if each were to furnish one student, there would be barely enough to maintain a college a single year, and what could it depend on for succeeding years? That State, too, is midway between Boston and New York, cities having each its strong college of pharmacy, competent and equipped to educate, if called upon, the entire yearly crop of students for the whole United States. No young man of sense would pass by these strong institutions which offer him such special advantages, and choose the weak school whose faculty would consist, as it must, of pharmacists who give their services for little or nothing, who are good druggists but poor teachers; a school lacking the building, laboratories, apparatus, the general and complete equipment vital to the real success of any teaching institution.

We do not wish to throw cold water on any scheme for progress: the motives underlying the Rhode Island proposition are most creditable to the hearts of its originators, but a little candid consideration of the matter must, we are sure, convince any one that it is ill-advised and impracticable. It will be far better for American pharmacy and pharmaceutical education to cease this multiplication of colleges, and seek to make those we already have better and more nearly what they ought to be.

A home manufacturer of chamois skins has appealed for a duty of 35 per cent. on these articles. This is inferential, if not conclusive, proof that the chamois skin comes from the back of the patient sheep, as we have oft been told, not from the beautiful animal so famed in song and story. Things are seldom what they seem, are they?

From a State which has no pharmacy law comes a letter saying "I have Perchest the Drugs Shore of ——." Moral: you can find it yourself. There are really several which can be deduced.

Correspondence.

We are pleased to publish here communications from our readers on topics of interest to the drug trade. Writers are requested to express their views as briefly as possible. Each article must be signed by its writer, but his name will not be published if so requested.

MR. OTT'S PLAN TO STOP CUTTING ON PATENTS.

[Mr. Francis S. Ott, of Sacramento, Cal., has devised a plan which, in his opinion, is calculated to minimize or entirely stop the evil of cutting on patent medicines. He submits his scheme to the chairman of the N. W. D. A. Committee for consideration, then to be published in the Era. The correspondence between Mr. Ott and Mr. Kline, and the plan in detail, are presented below for the study and judgment of the retail druggists.—Ed. Era.]

Letters.

Sacramento, Cal., Jan. 2, 1897.

Mr. M. N. Kline, Philadelphia, Pa.

Dear Sir: Enclosed find plan to "prevent cutting," on which, after reviewing, please give me your opinion. All four sheets are printed like a check-book. The different parts are perforated, each set bearing same number, the sets being numbered consecutively. The first is a stub and contains any memorandum needed by the manufacturer. The remaining three are detached, and the one "to the purchaser" is pasted to the package. Number the box or carton flap inside to correspond with outside number, so goods may be traced even if outside numbers are erased. Each dozen or case may bear label thus: No. 1 to 144, inclusive.

When shipped, enter on stub. If to a wholesaler, bill at regular retail price, less discount on old list and less amount of rebate checks. This account will at first have to be considered by jobbers and manufacturers as a consignment account. An invoice would read thus:

1 Gross "3 Day Malaria Cure," 75c. size		$108.00
Less 15¢ on old list $72.00.....	$10.20	
Less rebate check charged as consignment to be settled as goods are sold, or every 60 or 90 days, as agreed upon......	36.00—	46.20
No further discount payable in 10 days..		$61.80

Otherwise jobbers would complain on account of amount invested. It makes no difference to the manufacturer so long as the rebate check consignee account is paid as fast as he pays the retailer his rebate checks. Manufacturers could combine and have all rebate checks paid from one source to minimize expense. The agreement is legal, and to detach rebate checks and present for payment contrary to agreement would be obtaining money under false pretense. The manufacturer and retailer are the ones most benefited, and upon them are imposed all extra work and expense, which is very small when compared with the benefits to both to be derived. The manufacturer spends an amount to obtain say 100 sales for his goods, but owing to circumstances not over fifty sales are made. The retailer is his natural distributer, and they should work in harmony. Should the manufacturer eventually expect to sell his goods through grocers and department stores, he will then find them stocked with non-secrets and the druggist cutting the price; when nothing is to be gained by selling at cut rates, the new channel will soon tire, as houses are now making a specialty of manufacturing for department stores. If present circumstances continue, in two or three years the number of retailers will be decreased 50 per cent., but if properly managed there is room for all. This plan will compel the retailer to have one-third more invested in proprietary goods than before; but if manufacturers would have no lot discounts, you could decrease your stock and still be on an equal footing with the largest competitor. As to the extra trouble of signing and mailing agreements and rebate checks, this is better than to sell them at a loss or spend time "knocking" and "switching," to say nothing of the amount of sundry trade which will return to you when cutters have no special inducements to offer. When a few leading manufacturers adopt this plan the retailers should organize with a cash or note forfeit and request the balance to adopt it or refuse to handle their goods.

Respectfully, FRANCIS S. OTT.

* * *

Philadelphia, Jan. 12, 1897.

Francis S. Ott, Esq., Sacramento, Cal.

Dear Sir: I duly received yours of the 2d inst., and while I have not had an opportunity for carefully studying the plan you present, I am convinced, from what I know of the disposition of manufacturers generally, and also from the amount of labor and the additional investment your proposed system would entail upon those who handle proprietary medicines, that such a plan would not be likely to commend itself either to the manufacturers or the retailers. It has been my universal experience in this work of trying to assist the retailers to maintain prices, that while there are a few who are willing to take some trouble to co-operate with manufacturers in any system that may be proposed, the large majority object to handling preparations which are subject to conditions such as are proposed by you.

Many years ago, when cutting had not become so universal, I very strongly recommended the "coupon plan," which is exactly what this is. In order to test the retailers before a joint meeting of a committee of dealers and manufacturers was to be held, I sent out a very large number of circulars explaining the plan and asking the retailers who received them to vote either for or against it after studying it. I was surprised to find a very considerable proportion of them voting against it, and later on, to find in the pharmaceutical journals very strong letters written against it, on the ground of the additional investment to which it would subject the retailers.

There was also a great deal said about rebate vouchers becoming lost or mislaid, or probably being issued by proprietors who would fail before they could be presented; and thus the "penny wise and pound foolish" objections overruled the thing at that time, and I have no doubt will overrule it now. Retailers in very large numbers have since then been going on passing out these same medicines and losing *all the Profit* while under the proposed plan, even with all the risks they would have run for the reasons above mentioned, not ten per cent., at most, would have been lost at the outside.

Thus you will see that while this plan may be somewhat new on the Pacific Coast, all this has been thoroughly gone over in the earlier days of the cutting evil, and vetoed largely by the very people whom you are seeking to benefit.

I suppose you are aware, however, that the Pabst Brewing Company, of Milwaukee, Wis., is offering a reward for the best plan that can be suggested to stop cutting, and if you have not already sent a copy of this to that concern, I suggest that you do so.

I will also, as you request, mail this to The Pharmaceutical Era for publication, as it may there attract the attention of others; and if the sentiments of the trade have changed so that it now can be indorsed by a large proportion of the retailers, it would then probably be worth while to give it further consideration. Yours very truly.

(Signed.) M. N. KLINE, Chairman.

The Plan.

SHEET 1.

BOTTLE No. 1 to
BOTTLE No........... Inclusive.
SHIPPED to ....
AGREEMENT RETURNED ....
SIGNED by ....
LOT No...

"3 DAY MALARIA CURE."

Manufactured .. ..
Bottled by ....
Labelled by.......... ....
Packed by ....
Remarks.

* * *

SHEET 2.

BOTTLE No. 1. To the Purchaser.

"3 DAY MALARIA CURE."

The greatest discovery for malaria, chills and all fevers. Thousands of bottles have been sold in Sacramento and vicinity; every bottle sold sells others. It does not cause ringing in the ears or affect the head in any manner. It contains no poison, and may be given to children with perfect safety. It never fails, and will cure the worst cases in three days. A perfect solution; acts immediately. Two or three doses removes all symptoms of malaria, such as tired feeling all over, aching knees and elbows, pains in the back, hot and chilly sensations, loss of ambition and appetite, a desire to sleep at all times.

DIRECTIONS.

Take two teaspoonfuls with two teaspoonfuls of water four times a day. In obstinate cases every 2½ or 3 hours. Keep the bowels open with Ott's Liver Pills. This remedy is sold to dealers only by special agreement. See that the package number above has not been erased or the seals broken. Should any dealer offer or sell this remedy for more or less than seventy-five cents, you will be amply rewarded by notifying the manufacturer at once. Respectfully,

FRANCIS S. OTT.

SHEET 3.

BOTTLE No. 1.

Detach only when sold.

Sign two and return with all on hand to Francis S. Ott, 200 "K" street, Sacramento, Cal., and receive payment at the rate of twenty-five cents for each bottle sold as per agreement.

REBATE CHECK.

Not Negotiable. (Town and date.)

....

.... hereby certify that ....have sold........ bottles of "3 DAY MALARIA CURE" at seventy-cents per bottle, numbers corresponding to rebate check and agreements, and have fulfilled the agreement in every particular.

(Signed)

....

(Witness)

....

* * *

SHEET 4.

Bottle No. 1. Agreement slip.

To the retailer:—This remedy is sold through jobbers or direct only by special agreement. As soon as goods are received detach all agreement slips, sign two and return with others to manufacturer for approvai in order to receive profit when goods are sold, and coupons are sent in according to the following agreement:

This agreement entered into between FRANCIS S. OTT, Sacramento, California, to be known hereinafter as the "Manufacturer," party of the first part and .... of .... to be known hereinafter as the "Dealer," party of the second part, is evidence;

That the "Manufacturer" is the owner of the formula for and "Manufacturer" of the medicinal compound known as "3 DAY MALARIA CURE," and the "Dealer" is engaged in trade, in which drugs and other medicines are sold by the "Dealer," and the "Manufacturer" being desirous of selling to the "Dealer" and the "Dealer" being desirous of purchasing from the "Manufacturer" the said medicinal compound, "3 DAY MALARIA CURE," and the "Manufacturer" requiring that prices should be maintained at a uniform standard, and the "Dealer" being willing to conform to such requirement,, it is hereby agreed by and between the parties hereto;

That the retail price per hottle of said "3 DAY MALARIA CURE" is seventy-five cents;

That the price at which the "Dealer" purchases the same from the "Manufacturer" is seventy-five cents per bottle;

That in consideration of the agreements and obligation of the "Dealer" that he should maintain the price of seventy-five cents per bottle, the "Manufacturer" does hereby agree to pay to the "Dealer" twenty-five cents for every bottle of "3 DAY MALARIA CURE" sold by the "Dealer" at seventy-five cents per bottle, upon the return of the rebate check attached hereto, it being a part of the consideration for this agreement, that the "Dealer" will not detach the rebate check from any bottle until the same is sold, and that he will not present any rebate check for any bottle not sold in the usual course of trade; and, furthermore, the "Dealer" will not loan, trade, or in any way by himself or employés dispose of any of said compound except at the regular price of seventy-five cents per bottle. The "Manufacturer" agrees not to sell "3 DAY MALARIA CURE" to any dealer, except under the same form of agreement, and he agrees to promptly pay rebate checks when presented.

The respective rebate checks being made a part of each agreement and dependent thereon. The "Dealer" further agrees not to erase or deface package numbers or to hold the "Manufacturer" responsible for payment of rebate checks when it is shown that the "Dealer" has in any manner violated any of the terms of this agreement.

.... Witness. .... Signed.

.... Witness. .... Signed.

The 'Phone Question in Chicago.

Chicago, Ill., Jan. 8, 1897.

To the Editor: Having witnessed the scene in the Council Judiciary Committee meeting, I would like to correct "Prof." Hallberg's statement. I hope you will permit me to do it through your journal, because it is the most widely circulated of its class in Chicago. The fact is that the "Professor" was called down in the meeting by Mr. Ebert, who asked him what right he had to appear for the druggists. The "Professor" did not say that he appeared as a citizen. He distinctly stated that he represented Mr. Engelhard, a telephone subscriber, and is not a druggist. Everybody present heard the Professor say this.

The Professor mentions A. B. Rains' correspondence, and I therefore looked it up. It is remarkable how Mr. Rains' letter is fitted to the occasion. His new degree of "D. F." is the brightest yet brought forward. As "Prof." Hallberg calls attention to the fact that the druggists of Chicago voted for and against slot 'phones, Mr. Rains' letter comes most handy, for it showed that druggists are in the habit of voting for both sides of every question. They did so on education. They did so on free alcohol. Yours truly, A SPECTATOR.

THE DRUGGIST-DOCTOR.

M. L., Rochester, N. Y.—I have read the argument in the Era of Dec. 31, entitled, "Shall It Be Knight & Day, Physicians and Pharmacists," where you placed a question: How is the druggist to live if things continue this way? That is, in a condition where he makes no profits on patent medicine, sells no side articles, and is deprived of the prescription trade, because of the physicians who dispense their own medicines. It is, indeed, a very serious question which, I think, ought to be solved by the public at large. If the public recognizes the necessity of having for its service a class of professional men, specially trained and educated, on whom to place the important duty and responsibility of preparing and dispensing all kinds of medicines indispensably necessary for its use, it must in return repay the same by passing certain laws tending to facilitate the energy and protect the interests of the pharmacists. The pharmacists are recognized as a privileged profession all over the civilized world, and are everywhere protected by strict laws, which tend to recompense them for their most ardent duties toward humanity, while only here, in the United States, they are in a very deplorable condition. In this country, where laws are being passed and enforced daily to protect liquor traffic, horses, cats and mice, there is no law to protect the pharmaceutical profession, with whom frequently rests the issue of life and death of the public. Every peddler is allowed to sell medicine, every grocery or dry goods dealer is permitted to handle and supply the public with "medicine" the character of which is as strange to them as the sun's rays to the born-blind, and every physician takes the privilege of dispensing and selling his own medicine without being legally authorized to do so; while the pharmacist with all his professional competency, authority and financial investment, is left to pick the crumbs of the cake. The question is, where lies the cause of this evil? By no means with the various business men or physicians, neither directly with the public. It lies with the pharmacists themselves, who are not able to uphold the dignity of their professional calling, and, like babies, complain to their mammas of the spilled milk. The question is, brethren, to be or not to be? In the first place it is necessary that firm steps be taken by all the pharmacists of the United States toward the enactment of uniform laws that would discriminate the right of handling and selling drugs, and place the same in the hands of legally authorized persons to do so. All the pharmacists of the United States shall form a corporation, and as a body they will have sufficient power to manage their own affairs as well as any other union. The greatest necessity is also the recognition of diplomas issued by a college or any State board of pharmacy throughout the United States. As long as a pharmacist is authorized and entrusted to dispense medicine for his fellow-men in one State, why shall he not have the right to do the same in another. The existing arrangement is not only foolish, but wild. In order to accomplish some good, I would suggest the necessity of having elected in each State of the Union a number of delegates who shall assemble in a congress for the purpose of co-operative action toward the common interest of American pharmacists.

* * *

Charles B. Hull, Clinton, Conn.—The subject of physician-pharmacist is one requiring much consideration. Each profession has its own particular field of action, and any attempt to unite them will, I think, result only in making matters much worse than they now are. The doctor, of course, needs an emergency case, but it need not be of such dimensions as to require a whole corner of his office, or tempt him to resort to it constantly for his patients. Department stores, where patent medicines are sold at very low prices, have made such inroads upon the druggist's legitimate business, that, connected with the dispensing of the doctor, the druggist has hard work to make both ends meet. Yet, it is my opinion, that for the druggists to take up the practice of medicine, in order to better their condition and get even with the doctors, will, instead of helping matters, simply cut things up into such bits that there would be nothing for either. Moreover, if a doctor be thoroughly up in his profession he will have no time to bother with dispensing; neither can the pharmacist, if proficient in his line, have time to attend properly to his store and give the attention to patients they ought to have. By all means, let the two professions be kept entirely distinct and separate, and by hearty co-operation each will have all he can properly attend to.

* * *

W. C. Hillard, Bristol, Conn.—As to what my idea of the pharmacist of the future is, I find it hard to formulate an idea in the matter. What between the department store on the one hand, and the grocery man on the other (for in Connecticut grocers sell gum camphor, sulphur, ground flaxseed, peppermint, paregoric, laudanum, mineral waters, patent medicines, etc., etc.), and the physician with his tablets and portable drug store, the Lord only knows what the pharmacist of the future will be. I think he will have to "work for a penny a day and board himself," to use a common expression, and I don't believe it will help him to add to his course in pharmacy a course in medicine. I see that the colleges of pharmacy are discussing the question of graduating men who have no practical experience, the Buffalo College having already done so. I would not give a cent a dozen for such creatures. Of the three boys I have sent from my store to the New York College, one graduated at the head of his class, another was honor man and the third did well; so much for three and one-half years' experience. What is the next cranky notion?

* * *

J. A. Settle, Waverly, Mo.—I foresaw the advantage of being both, and so secured both degrees for myself before entering business. I now conduct drug store, employ clerk and maintain practice. I believe where an M. D. possesses business qualifications and has trusty employés that the "combination" is a decided success, especially in the lesser sized places.

Anniversary Echoes.

John Pfeiffer, Brooklyn, N. Y.—Allow me to congratulate you upon the decennial natal day of the Era, and especially the editorial department of the latter. May it live long and pour forth its wisdom and advice. It should be in the hands of every pharmacist in New York, especially at so low a figure.

F. B. Kilmer, New Brunswick, N. J.—There is no criticism to be made of the two blooming graduates, either as to their dress or make-up, except that I do not believe that your prophecy of the double diploma is liable to be fulfilled. It is a striking picture, however, and the entire number is a triumph in American Pharmaceutical Journalism.

Judson B. Todd, Ithaca, N. Y.—Tenth Anniversary Number at hand. Allow me to compliment the same and congratulate its "makers." It is comprehensive, artistic, readable. Your editorials are good, particularly the one headed "Best Regards." I shall use it much for a book of reference. Hope this may be the first of many more Anniversary Numbers.

Frank M. Mares, Chicago, Ill.—Allow me to congratulate you on the success of your valued journal. The Tenth Anniversary Number of The Pharmaceutical Era which has just reached me is certainly a good proof of what you have already accomplished, and certainly shows that its future standard as a druggists' journal will always be retained at any cost. I again congratulate you on your success, and wish you a prosperous year.

David M. R. Culbreth, M. D., Baltimore, Md.—I must compliment you upon your mammoth Anniversary Number. It surely far exceeded my expectations, as formed from its announcement possibilities, in the very large amount of interesting and useful matter. Every pharmacist could well spend, to profit, many hours in its reading. Its entire makeup is attractive, having, in general, a substantial appearance. I trust the suggestions of colored frontispiece (cover) will be realized by those who come in the next century. After this—our day of unrest—such a condition will truly be to the druggist his long-looked for millennium.

Joseph Jacobs, Atlanta, Ga.—From your initial number until now I have been a constant subscriber and reader, pleased always with your publication, and I trust that the reasonableness of your advance in price from $2 to $3 per annum will be favorably regarded by your clientele. I cheerfully testify to the sincerity and success of your efforts to give us all of the profession a first-class journal, full of useful, interesting and valuable reading matter from week to week, and hope that your every undertaking towards progress and improvement may be liberally assisted by the increased patronage you deserve.

Toilet and Nursery Powder.

Boric acid in finest powder	8 ounces
Oil of petitgrain	2 minims
Oil of neroli	2 minims
Oil of bergamot	2 minims
Otto rose	5 minims

If desired this may be colored pink by the addition of 10 grains of carmine.

CONTRIBUTIONS TO THE CUBANS.

By ALEXANDER KOONES, New York.

The following opinion, written in answer to the question "To what extent may citizens of the United States lawfully contribute medical supplies to the Cuban patriots?" may at this time be of interest to your readers.

The question presented for opinion belongs exclusively to the department of international law. That law requires that in case of war all nations not parties to the conflict shall abstain from interfering or showing partiality to either of the belligerents. This is the law of neutrality, and its violation generally means war against the offending nation.

It applies not only to a war between two independent nations, but also to a war waged against the established government of a country by a portion of its people—such as the present Cuban war.

The United States has always maintained as a part of its foreign policy this law of neutrality, and not only observes itself, as a nation, the strictest neutrality, but requires its citizens also to do so by abstaining from such acts as would be violative of it.

What specific acts partake of that character must be determined by a reference to the statutes of the nation, the treaties made by it, and the common law of nations. They do not come within the province of State legislation.

The power "to define and punish offenses against the law of nations" is one of the powers expressly conferred upon Congress by the Constitution of the United States. (Article VI., Section 8).

I.—With the exception of treaties made for the settlement of claims we have, since '76, entered into only two treaties with Spain, neither of which contains anything relating to the question under consideration.

II.—The only legislation of Congress is the so-called "Act of Neutrality," passed April 20, 1818, amended in 1875 and 1877, and incorporated into the Revised Statutes of the United States as amended in 1878. (U. S. Rev. Stats., Sections 5,281-5,291).

Under the provisions of these sections the following overt acts only are referred to, viz.:

(1) Accepting a commission to serve in a foreign war against a nation at peace with the United States.

(2) Enlisting or retaining another to enlist in such a war.

(3) Arming or fitting out a vessel engaged in such a war.

(4) Augmenting the force of a ship or vessel of war employed against a people at peace with the United States; and

(5) Beginning or providing the means for a military or naval expedition against a people with whom we are at peace.

As medicines and hospital stores are included in the terms "military supplies" and "naval stores" I do not consider it will be allowable under this "Act of Neutrality" to furnish within the United States such articles to a Cuban vessel of war, or to a military expedition started within the United States for the purpose of aiding the Cuban cause. In all other respects, the act does not prohibit such contributions. I would state generally that the act refers to cases where the parties who are made liable to punishment become actual participants in the hostile proceedings.

III.—It remains now to be considered whether the common law of nations would make a punishable offense any transaction of the kind referred to in the question.

Upon this point it is evident that if, under the common law of nations, it were an offense for the citizen of a peaceable nation to contribute medicines or hospital supplies to the army of a people engaged at war, at least one illustrative case would be found somewhere in the books. I myself have found no such case, and that none exists is evident from the fact that no reference is made to any by such eminent authorities upon international law as Kent, Wheaton, Woolsey or Wharton.

Dr. Wharton in his Digest of International Law, compiled for the Government and published in 1886 (Vol. III., p. 508), declares:

"The furnishing funds by subjects of a neutral State to relieve suffering in a belligerent State is not a breach of neutrality."

And in his work on American Law, published in 1884, referring to this subject, he says (Wharton's Am. Law, Sec. 245):

"Dismissing from consideration, therefore, the 'Three Rules' and the proceedings based on them, we must look to the works of leading publicists and to the decisions of the courts, taken in connection with the present condition of civilization, to determine what is the law of nations in respect to neutrality. And the first position we have to take is that the furnishing of funds by subjects of a neutral State to relieve suffering in a belligerent State is not a breach of neutrality. During the Franco-German war large sums of money were sent from Germans in this country to their friends in Germany, for relief of sufferers in the hospitals, and large sums were also sent by persons in this country sympathizing with France to the French hospitals; but neither in respect to meetings called to express sympathy with the one or the other belligerent was it maintained that such action constituted a breach of neutrality. * * *

"But that the subjects of a nation may, without involving the nation in a breach of neutrality, express sympathy with a belligerent in a foreign war, or even contribute funds for the relief of persons engaged in such war, cannot be questioned."

The convention concluded August 22, 1864, between Baden, Switzerland and other nations, including Spain, and acceded to by the United States in 1882, "For the amelioration of the wounded in armies in the field," while it does not, in terms, refer to the contributions of medicines and medical supplies, nevertheless in spirit recognizes the neutral character of such articles when carried in ambulances protected by the sign of the Red Cross. (22 U. S. Stats., at L., p. 940).

In conclusion. I would state, as my opinion, that the contributing to the Cuban cause by a person within the United States of medical supplies or of funds for the purchase of such supplies, or in aid of a hospital, would not be an illegal act, provided they were not furnished to an expedition fitted out within our boundaries, or to a vessel of war afloat within our waters.

Violet Tooth Powder.

Precipitated chalk	8 ounces
Cuttlefish powder	2 ounces
Powdered castile soap	2 ounces
Powdered orris root	4 ounces
Ionone	20 minims
Anethol	5 minims
Carmine	30 grains
Tincture of orris	½ ounce

Rub down the carmine thoroughly with a little of the chalk; add the rest of the powders. Dissolve the perfumes in the tincture, and add this to the mixed powders. Rub till dry.

Lip Salve.

Benzoated lard	8 ounces
Spermaceti	4 ounces
White wax	2 ounces
Oil of sweet almonds	1 ounce
Balsam of Peru	1 dram
Alkanet root	2 ounces

Digest the alkanet root, coarsely powdered, in the benzoated lard and the oil on a water bath, until a spot of mixture when cold shows a deep rose tint, then add the Peruvian balsam, strain through flannel, and melt the spermaceti and wax in the bright liquor, finally perfume with

Otto	10 minims
Oil of ylang ylang	5 minims
Terpineol	20 minims

(*For the Era.*)

THE PANSY'S POOR RELATIONS.

By HELEN INGERSOLL.

Unfortunately for the United States the sweet violet of classical lore does not grow wild in their soil, unless as a garden-escape. We have only the obscure relations of that flower, which has perfumed the pages of many an author since Cæsar's time.

Nevertheless, although our violets have not shared the fate of the European tri-colored species, which has been forced by the gardeners into the large size and glorious tints of the pansy; and although they have not been raised, like the English violet, to prominence in song and art and embroidery, on account of their color and associations, yet a careful study shows that they have a charm, and some of them even an odor, quite equal to that of their rivals.

This is especially true of the tiny white violet (*Viola blanda*,) "which is sweet, but not so strong as our blew violets," writes an old colonist. Its ivory flowers seem to exhale a purer and heavier perfume when its glistening, thready roots barely keep the pale leaves from toppling into the water of the muddiest of marshes, than when the plants assume the more stalwart form sometimes found on dry land.

Another species, normally found in dry ground, the bird's foot violet (*V. pedata*), the deeply cut leaves of which vaguely suggest green silhouettes of a bird's claw, has also been blessed with a delicate perfume. Its large star-shaped flowers, that, in May, crown the tufts of half-opened leaves, range through a variety of purple, lavender and lilac shades to white, causing certain hillsides, where they grow in masses, to seem veiled in a filmy cloud of blue. Perhaps their perfume is more distinct in the paler blossoms, as often happens among hepaticas, which also show albino forms, and both hepaticas and violets are most fragrant when plucked in the hot sunshine, for, as Shelley has observed,

> "Odours, when sweet violets sicken,
> Live within the sense they quicken,"

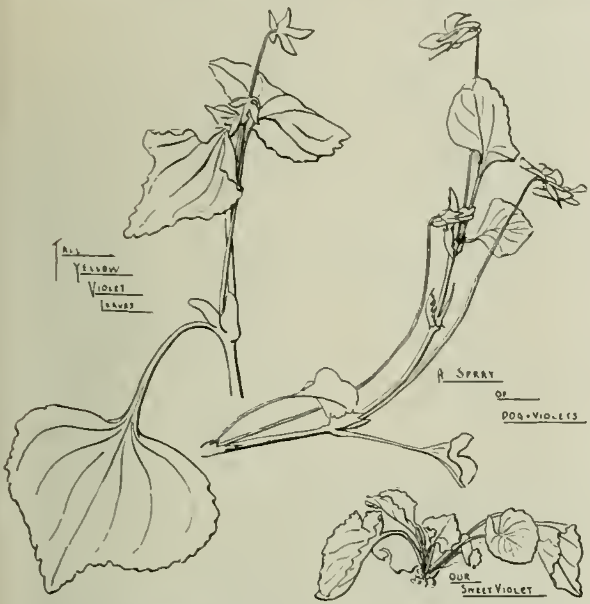
and this fragrance seems most delicious just as flowers begin to wilt—it is like a swan song.

Each of the violets mentioned above belongs to the first of the two great divisions into which our species are grouped; those having no stems, the flowers rising directly from the root on leafless scapes, being in one class, and those possessing true stems, clothed with leaves, belonging to the other. Mr. John Burroughs insists that in this latter company the tall Canada violet, which blooms all summer in the northern part of the Eastern States, and has a star-shaped blossom, distinguished from all others by the lavender under-surface of its creamy petals, also is fragrant.

Others in this class, although lacking odor, attract one by their coloring and size, like the sturdy *Viola striata*, which renders itself conspicuous among its kind by opening its opaque white flowers, plenteously streaked with purple, in mid-summer; or the tall yellow *Viola pubescens*, whose stem and robust, heart-shaped leaves are colored a most pleasing tint of yellow-green, softened by a thick fur, that perfectly harmonizes with the brilliant canary colored bloom borne aloft and set off by jet-black markings.

The dog violets (*V. canina*, var. *Muhlenbergii*,) are attractive because of their pert little blue faces massed over the top of sprawling patches of plants. The long-spurred violet (*V. rostrata*), a much rarer species, fully deserves its name, for a long, delicate tube, pointing backward like the sword under a cavalier's mantle, is nearly twice as long as the squarely arranged petals, which are in color pale-blue, exquisitely marked by splashes of purple. Both of these violets are leafy-stemmed species, and, given a fair opportunity, make up for their absolutely scentless condition by growing in tremendous hassocks, with many blooms, which can escape the notice of no insect, however blundering.

Among the stemless violets, the yellow (*V. rotundifolia*), whose leaves, large and shining, lie flat on the ground after the delicate golden flower has vanished; the palmate (*V. palmata*), and arrow-leaved (*V. sagittata*), which appear quite the earliest of their kind, are also the best known. The variety of the *Viola palmata*, called *cucullata*, or hooded violet, is the commonest form. Its blue flowers sometimes open to the sun before they dare desert the warm soil, and they consequently crouch low on the rolled-up corners of the supine leaves, achieving an effect that is noticeable in violets from the Andes, namely, a very large blossom nearly concealing a small, low plant. This lowliness of growth, assumed for prudential reasons, leads poets to sing of the "modest violet." Later, however, it throws off all pretense of hiding and grows vigorously, attempting to overreach the grasses about it, and sometimes stretching up to a good eighteen inches of fragile, watery stalk in the effort. Magenta, streaked and blotched with white—occasionally albino forms are found—dark-blue, pale-blue, and still paler blue, marked by deeper color, which is the particular suit worn by the hooded violet when growing in wet places—all these are tints sported by this species.



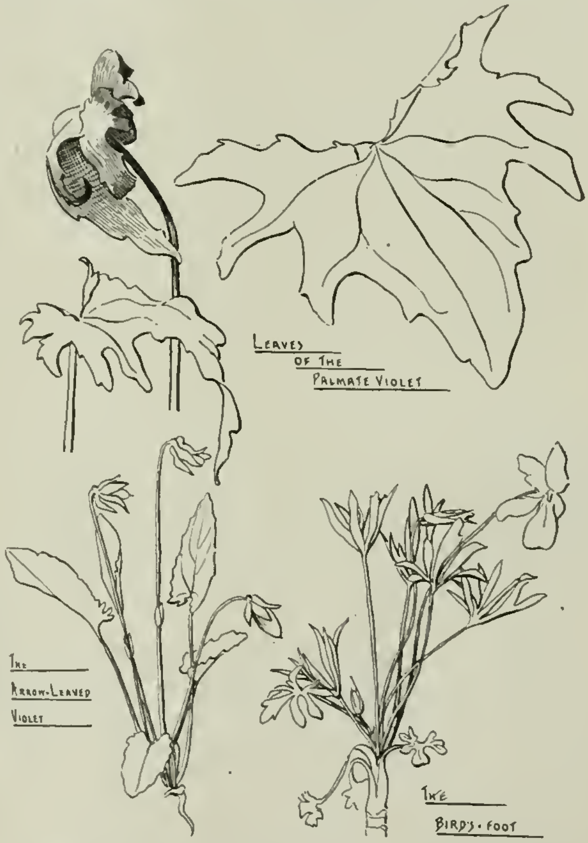
The texture of the leaves varies also in this violet with individual plants, in different situations, those in dry soil being more or less hairy, possibly in order to catch the dew or to conserve the moisture otherwise wasted by evaporation, while the swamp plants, having no need for such devices, are pale and smooth. The typical palmate violet shows a very graceful leaf, sometimes heart-shaped like the hooded variety, more often cut and lobed, which is especially noticeable after the handsome flowers have fallen; for the leaves of these, as of many other violets, continue to grow and expand to a great size after flowering.

In many instances—such as in the hooded, the dog violet, and a smooth variety of the tall yellow violet—these later leaves conceal little green cones, that look like undeveloped buds, and are the half-grown fruits of flowers which have been fertilized underneath or at the surface of the soil. Open a green case which has just pushed out of the ground, and you will see an ovary with a short style on top, the stigma bent to one side in such a manner that it cannot avoid receiving the pollen from the anther cells, which closely surround the ovary, and in here, safe from the intrusion of any but the minutest insects, the seeds are self-fertilized, and, in time, the three valves of the capsular fruit fly apart, and scatter the seeds far and wide.

Upon these quiet flowers, therefore, the entire work of seed-making would seem to be foisted, as upon a Cinderella. However, the showy flowers that precede them, which apparently have nothing better to do than to flaunt in a gay endeavor to steal the azure vesture of the sky, carry a very complete arrangement with which to inveigle insects into transferring pollen from one hospitable flower to another, and thus secure "new blood" to be subsequently absorbed by the seed-germs matured in the much-sought blossoms.

The lower petal of a violet is prolonged into a spur, two of which Indian children often hook together, and then, by snapping the heads off, form a sort of game, from which a name for the violet, meaning "two heads entangled," is derived in each of two Indian languages. This spur contains honey, secreted by a couple of appendages projecting into it, and a hairy channel in the lower petal, roofed by a hollow stigma attached to the apex of the ovary by a flexible style, leads horizontally into its cavity.

The proboscis of an insect that has previously visited some other violet and is anxious for more honey, slips along this channel, which is the only open passage of the flower, since the stigma and its tightly-clasping collar of anthers fill up the space where petals and sepals meet; but on its way some of the pollen just dusted upon the proboscis by the violet last forsaken, is scraped off upon a swinging curtain that hangs transversely across the channel—a lower lip so to speak—depending from the gaping mouth of the stigma that opens, like a shark's mouth, in the under side of the roof, and the grains are detained there, sticking on the stigma's viscid surface. When it withdraws its proboscis, the insect pulls forward the curtain, which is forced up against the raw stigma, thus keeping it from contact with its own pollen, which sifts out of its anthers just back of the stigma, onto the



hairs of the channel in the petal, there to be wiped up and carried away by the visitor and left on the next scraper.

Doubtless, besides their beauty, certain members of the whole tribe are endowed with their characteristic, cool odor as an additional attraction for insects, in order that this cross-fertilization may be effected. But the fragrance has also endeared itself to woman-kind, and, recognizing this, perfumers have devised various ways of capturing the evanescent principle in order that they may again dispense it for the world's enjoyment.

Not only is the *Viola odorata*, the common English and Mediterranean violet, now raised under glass all over the civilized world, for florists' uses; but in Italy whole fields are given over to the cultivation of it in its single and double, blue, purple and white varieties. The blossoms, particularly the double ones known as Neapolitan, are forced, by a system called enfleurage, to transfer the odorous principle in their petals to prosaic lard. As soon as possible after blooming the flowers are picked, "with the dew on them," and are then sprinkled in frames over glass slides coated with a thin layer of lard or a similar clean fat. By piling up the frames and slides a sort of box is formed, in which the flowers are left until wilted, and then new ones are substituted for them, this process being repeated until the lard is saturated with the contents of the little urns of fragrance that have overlaid it.

There are several other ways in which flowers having a delicate odor, such as violets or jasmine, are treated for the extraction of their scent; sometimes, when the fragrance is not too evanescent, they are placed in small bags of fine linen and cooked in hot fat or oil. Either proceeding results in a pomade, or oil, from which the absorbed odors are afterward extracted by alcohol, and, as the fats can never be entirely deprived of scent by the spirit, the remaining fragrant pomade is used in divers places where such a substance is needed. Other materials, by the way, mineral substances, orris root or cassie flowers, are often used in perfumery to simulate the true violet odor, that particular extract and essential oil being very expensive.

Very little use has been made of the violets in any other industry. One wonders at the curious taste displayed by the historian of John Smith's colony, who refers to violets as plants good for pot herbs and salads, even while one is nibbling at violet petals conserved in sugar.

During the French campaign in Egypt, however, the supply of ipecac becoming exhausted, the army surgeons used powdered violet plants in place of it. In Continental countries, moreover, violets are officinal, occurring in most pharmacopœias. That one, especially, called Johnny-jump-up (*V. tricolour*), which occasionally escapes from cultivation in the United States, to grow wild as it does in its native woods of Europe, was formerly considered of great value in children's diseases, and is still prescribed in Germany.

For a little while the violet had a forced prominence in France, quite different from either its commercial or poetical fame. As the violet in Europe is the especial flower symbol of March, either a fancied prophecy by Bonaparte that he would "return in the spring" from Elba, or the fact that he did land on French soil in March, induced the Bonapartists to adopt the purple blossom as their party emblem. During the reign then of the ill-fated Napoleon III. a bunch of violets held the same position in the eyes of ardent Parisian partisans as does the tiny shamrock in an Irish heart; and later, when the loyalists were endeavoring to revive the empire, violet shades were as prominent in Paris as yellow is on Primrose Day in England.

However, it may have been because Napoleon had dreamed of violets, and had happened to hear of the English superstition, which foretells advancement in life for the lucky dreamer, that he thus chose the little plant as a symbol.

It is better to avoid seeing violets blooming in autumn, say the soothsayers—it is a sure warning of a succeeding epidemic, and similar tales, superstitious and legendary, have grown up around violets. Larousse, in his universal dictionary, tentatively relates a couple of legends hinged on the fact that the Greeks name for the violet was *ion*. Jupiter, he says, upon one of his visits to the beautiful Io, was presented by a nymph with a violet, considered by her to be the most cherished flower of the country; or, as another fancy has it, after transforming Io into a heifer, Jupiter created the violets in order to adorn her pasture. The Athenians, it seems, claimed to be descended from Io, and, consequently, chose the violet as their symbol, wearing it on feast days, and particularly on occasions of great hilarity, since a garland of violets about the head was supposed to counteract the effects of too much wine. In the Middle Ages it was used to crown victors in certain contests, and still another custom of the Greeks was continued in the same period—a custom of throwing violets upon the tombs of young girls. Perhaps the use of violet shades in mourning costumes, and the general designation of gloom by this color originated in this latter practice. Cicero impatiently asks if he shall speak "in violet or rose," apparently contrasting the moods of sadness and joy in the metonymic phrase, and to this day we have the "blues," or look through "rose-colored glasses," as the case may be.

In a word, the violet tribe, from the pansy to the common wood violet, has become entwined in the wreaths of fancy and our every-day speech, to an extent attained by perhaps no other flower, and it bids fair to always remain the favorite among the blossoms of poetry.

PRODUCTION OF AMBER.—The working of amber in Prussia is a monopoly in the hands of a firm which owns the best two mines, Palmnicken and Kraxtepelle. For the concession the firm, according to Consul Hunt, of Dantzig, pays to the German Government a royalty of 650,000 marks (about $162,000) a year. It is reckoned that this firm has up to now paid no less a sum than $5,000,000 in royalties to the German Government. In addition to the output from the mines in 1895, a good deal of amber was picked up on the beach at Pillau, in the province of East Prussia, being washed up with the seaweed during the prevalence of northwesterly gales. The shore at Pillau after a storm is sometimes covered with a layer of seaweed 3 feet thick, among which the amber is found entangled. Men, women and children find easy and lucrative employment in searching for the amber along this part of the amber coast. The people engaged in this precarious work often earn 30 shillings a day and more. In 1895, about 100 tons of raw amber came to Dantzig to be worked up, as compared with 140 tons in 1894. It was nearly all melted to make lac and varnish. The larger pieces are made into beads, which are sent all over the world. The beads known to the trade as Leghorn corals were in strong demand. (Sci. Am.)

PHARMACY.

MORPHINE has been discovered by Heim, of Würzburg, to be an antidote for poisoning by potassium cyanide.

TOOTHACHE ANODYNE.—Cocaine hydrochloride 0.1 gm.; camphor, chloral hydrate, of each, 5 gm.; distilled water, 10 drops.

TOXIC PROPERTIES OF BORIC ACID.—A case of death has resulted from the administration of 40 gm. of boric acid in form of an enema. Doses of 0.2 to 1 gm. have resulted in death when given to guinea pigs.

PEARL HARDENING is an artificial hydrated sulphate of lime chiefly used by paper makers for filling and glazing paper. It is produced as a by-product in the manufacture of alkalies and other substances.

PREVENTIVE AND HEALING AGENT FOR INSECT BITES.—

Acetic ether	5 p.
Eucalyptol,	
Cologne spirits, of each	10 p.
Tr. Persian insect flowers	50 p.

This is to be mixed with 3 parts of water and used to bathe the hands and face.

DETECTION OF CARBON MONOXIDE.—Habermann (Ph. Post) recommends passing the air or gas, which contains carbon monoxide, through a solution of silver nitrate to which aqua ammonia has been carefully added in just sufficient amounts to almost dissolve the precipitate of silver oxide which forms. The presence of 1-10 per cent. of this gas will cause a brown coloration.

PROFITS FROM THE SWISS ALCOHOL MONOPOLY.—Consul Germain, of Zurich, states that the budget for the Swiss alcohol traffic submitted to the Swiss Federal Assembly by the Federal council shows estimated total receipts of $2,516,000; expenditures, $1,322,400; an excess of $1,193,600, and a disposable profit of $1,070,000. This profit, about 36.4 cents per capita of the population, is divisible among the various cantons. (Con. Rept.)

A METHOD OF ADMINISTERING CREOSOTE, proposed by Kopp, is as follows: Creosote and benzoin, of each 1 gram ;powdered wood charcoal, 6 grams. The creosote is mixed with the finely powdered benzoin, which is then gradually added to the charcoal. The resulting powder is divided into 5 or 10 cachets, each dose containing either 0.2 or 0.1 gram of creosote. In this form creosote is readily tolerated by the most sensitive stomach.

TO NICKEL-PLATE WOOD.—The following solutions are prepared:

1. One-half gm. of caoutchouc and 4 gm. of fused wax are dissolved in 10 gm. of carbon disulphide. To this is added a solution of 5 gm. of phosphorus in 60 gm. of carbon disulphide, with 5 gm. of oil of turpentine and 4 gm. of powdered asphalt.

II. Two gm. of silver nitrate are dissolved in 600 gm. of water.

III. Ten gm. of gold chloride are dissolved in 600 gm. of water.

The wooden object is attached to a copper wire (which serves as the conductor in electroplating) and then immersed in solution I., after drying; solution II. is poured over it, and the object is allowed to remain suspended until it takes on a dark, glossy appearance; after washing with water, it is treated in the same way with solution III., whereby the surface of the wood takes on a yellowish appearance, when it is ready for the plating bath.

ACTION OF FERRIC CHLORIDE UPON MERCURY. (Pharm. Central-H. Jr. Soc. Chem. Ind.)—Laurenz had proposed to prepare mercury for use in mercurial ointment by shaking the metal with ferric chloride solution; but as this gives rise to a production of calomel, the method does not work satisfactorily. It is, however, suggested by P. Suss as very possible to utilize the reaction for the production of pure calomel, with the aid of a centrifugal machine and a gauze sieve.

ADHESIVE PLASTERS ARE, CORN PLASTERS are not, medicinal preparations, so decides General Appraiser Wilkinson, of this port. Adhesive plasters are employed as dressings for wounds, to prevent contact with the air, to keep the parts moist, to hold the parts together, and thus to facilitate the healing of the bodily disorder. The bunion or corn plaster or ring is simply a mechanical device which purports to prevent the pressure of the shoe against the corn. There is no evidence or information to show that it is an instrument of healing. So much for a judicial decision.

EXPLOSIVE PROPERTIES OF ACETYLENE GAS.—An explosion of several cylinders of liquefied acetylene gas took place in Berlin whereby four lives were lost and the laboratory entirely destroyed. It is supposed that through leakage the explosion took place, a mixture in the proportions of 1 to 12 with air being sufficient. Lately a like explosion took place in Paris, caused by a workman unscrewing the cap of a cylinder of the compressed gas, the heat generated by the friction, though but very slight, was sufficient to cause the explosion; the slightest heating or sudden jarring is sufficient to cause these dangerous accidents. Experimenters are warned of the dangerous characters of this new illuminating agent.

ESTIMATION OF COPPER IN VEGETABLES.—Paul & Cownley (Phar. Jour.) recommend the following: 100 gm. of the material are ashed in a platinum crucible, the ash is extracted with concentrated hydrochloric acid, then filtered through a filter (moistened with acid) and washed. The insoluble residue is washed from the filter into a capsule and treated with a few drops of concentrated nitric acid, dried and ignited. The ignited mass is then treated with concentrated hydrochloric acid, filtered and the filtrate added to the above mentioned filtrate. The mixed filtrates are concentrated to about 40 cc., and the copper precipitated by means of pure tin. If the precipitated copper does not possess a pure copper color, it should be dissolved in a little nitric acid and estimated colorimetrically by addition of aqua ammonia.

RESAZURIN.—An indicator for alkalies; it may be prepared by adding 40 to 45 drops of nitric acid (1.25 sp. gr.), which has been saturated with nitrogen trioxide, to a solution of 4 gm. of resorcin in 300 cc. of anhydrous ether. After standing in a cool place for two days, a mass of black colored crystals collects on the bottom, the red-colored fluid is decanted off and the crystals are washed with ether until the wash water is colored blue by ammonia. This resazurin ($C_{12}H_7NO_4$) is but slightly soluble in ammonia, more so in alcohol and very soluble in acetic ester; it gives a blue color with alkalies and alkali carbonates, reddened by acids.

In using for indicator, a solution of 0.2 gm. resazurin in 40 cc. $\frac{N}{10}$ ammonium hydrate is prepared, adding water to make 1,000 cc. This solution (1 :5,000) is very stable, possesses a deep blue color, 2 to 3 drops being sufficient to color 200 cc. a sky blue.

This indicator cannot be used in presence of nitric acid and mono-basic organic acids; it is, however, very sensitive to alkalies; the simple heating of water in a glass flask serves to turn rose (acid) resazurin a blue color from the traces of alkali dissolved from the glass.

HUMANIZING COW'S MILK.—In order to prepare from cow's milk a mixture which compares closely with mother's milk, Marchaud proceeds as follows: Into a graduated vessel of 2 liters' capacity, the necessary daily quantity of milk is placed, for example, a child three days old, 480 gm., up to 30 days, 600 gm.; 2 to 3 months, 720 gm.; 4 months, 800 gm.; 5 months, 900 gm.; 6 to 8 months, 1,020 gm.; 9 to 10 months, 1,200 gm. The vessel which is closed hermetically is set aside in a cool place 4 hours, during which time the milk will have separated into two layers; then without disturbing these ⅓ of the lower layer is drawn off by a stopcock (placed near the bottom of the vessel), adding a corresponding volume of water which contains 35 gm. of milk sugar and 1 gm. of salt to the liter. The mixture is then well shaken and sterilized in the usual way.

SUBSTITUTE FOR MOTHER'S MILK.—Dr. Lahmann has produced a "vegetable milk" which is mixed with cow's milk as a substitute for mother's milk. It is prepared from nuts and almonds with sugar, and forms a fatty emulsion with a finely flocculent casein like that of human milk. Dr. Hock, of the National Foundling Hospital, at Vienna, has found this mixture to give very favorable results. Another human milk substitute is Gärtner's Fettmilch (Fatmilk, D. R. P., No. 82,510); its composition, as compared with cow's and women's milk, is:

	Fat.	Casein.	Milk sugar.	Mineral matter.
Women's milk	3.78	1.03	6.61	.31
Gärtner's Fatmilk	3.20	1.42	5.15	.33
Cow's milk	3.69	3.02	4.88	.71

(Zeitschr. fur Naturw. Br. & Col. Dr.)

THE MOST EXPENSIVE PRODUCT IN THE WORLD.—As a matter of curiosity, says Consul Morris, of Ghent (Consular Report), I forward the following translation of a statement recently published in European newspapers showing the article which, it is claimed, sells at the highest price in the world:

What is the most expensive product of the world, inquires Mr. Wilfrid Fonvielle? He answers, It is charcoal thread (filament de charbon), which is employed for incandescent lamps. It is, for the most part, manufactured at Paris and comes from the hands of an artist who desires his name to remain unknown in order to better protect the secret of manufacture. It is by the gram (15½ grains) that this product is sold at wholesale. In reducing its price to the basis of pounds, it is easily found that the filaments for lamps of 20 candles are worth $8,000 per pound, and that for lamps of 30 candles they are worth $12,000 per pound. The former have a diameter of twenty-thousandths of 1 millimeter (1 millimeter = 0.0394 inch) and the latter four and one-half thousandths of a millimeter. The filaments for lamps of 3 candles are so light that it would require nearly 1,500,000 of them to weigh a pound. As the length of each of them is 10 centimeters (3.937 inches), their total length would be 183 miles.

DETECTION OF FORMALDEHYDE IN MILK.—In view of detecting traces of formaldehyde, which some unprincipled dealers add to their milk for its preservation, the Hygienic Institute, of Hamburg, recommends the following procedure: 100 cc. of the milk are placed in a liter flask and steam is blown through till from 10 to 30 cc. of distillate are obtained. This is then tested for formaldehyde direct.

Among the tests are the following:

Thomson's Reagent: A 1 per cent. ammoniacal solution of silver nitrate as well as a silver solution containing an excess of potassium hydrate are reduced by the slightest trace of formaldehyde.

Schiff's Reagent, which is a very dilute fuchsine solution decolorized with sodium bisulphate, is colored red when added to the distillate, if formaldehyde is present. The addition of hydrochloric acid causes a change from violet to pure blue. The addition of this reagent to salts of weaker acids, as acetic, citric, lactic, oxalic and phosphoric causes a red coloration also. However, the addition of hydrochloric acid causes fading of the color, instead of the blue, as above. The free acids do not react with this reagent.

Hehner's Modified Test consists in adding peptone and sulphuric acid to the distillate, whereby a blue coloration is obtained.

Nessler's Reagent gives a pale yellow precipitate in dilute formaldehyde solutions, while concentrated give a yellow-brown to gray precipitate. This precipitate may be distinguished from that produced by ammonia, by the addition of a weak potassium cyanide solution, the latter forming a clear solution while the aldehyde precipitate remains undissolved. If excess of cyanide is added, the precipitate turns a gray color, and the fluid becomes turbid.

MUCILAGES FOR LABELS.—Druggists are very often in need of good, adhesive materials for their labels, and the following given in the Drogisten Zeitung (Nat. Dr.) may be found useful:

For Tin.

1. Starch paste and carpenters' glue mixed warm.
2. Four parts of water glass with one part of rock candy syrup, adding later some powdered sugar.
3. Preliminary painting of the tin with shellac varnish or tincture of benzoin, and for adhesive material, glue mixed with gum arabic mucilage.
4. Mucilage of gum arabic with 10 per cent. of glycerin. In all cases the surface of the tin must be clean, and free of fat.

For Pasteboard.

Sixty parts of borax dissolved in 420 parts of hot water and then warmed by moderate heat with 480 parts of dextrin and 50 of glucose, being stirred together until all are dissolved. The mixture is then strained through a thick woolen cloth. The preparation holds fast, and dries rapidly.

For Glass.

A good dextrin solution holding a twentieth per cent. of thymol preserves paper labels from curling off in a damp cellar.

For Parchment Paper.

Twenty parts white glue, 40 parts dilute acetic acid and 1 part of bichromate of potassium. The glue is first soaked in water twelve hours, and then dissolved in a water bath, and to this the aqueous solution of the bichromate is added. It must be done in the dark, as day or sunlight will make the mixture insoluble. This may also be used as a putty for glass.

EXAMINATION OF DAMMAR RESIN.—Tschirch and Glimmann have made an exhaustive study of this resin, and published it in the Schweitz, Wochenschr. f. ch. u., Ph., from which the following is abstracted:

The sample (Batavian resin) was powdered and exhausted with alcohol in a Soxhlet's extraction apparatus. It required about six months, until the resin was completely exhausted of soluble (alcohol) material, 33 per cent. being insoluble, constituting a grayish white mass. The united alcoholic extracts were poured into water, yielding a pure white resin, melting at 100° C., soluble in ether, chloroform and absolute alcohol.

Distillation of the crude resin with steam yielded a volatile oil, possessing a peppermint-like odor, boiling at 82° C.

The above-mentioned pure white resin was dissolved in ether and shaken with a potassium hydrate solution (1:1,000) which, upon neutralization with hydrochloric acid, yielded a white precipitate. This precipitate was dissolved in ether, and treated as before several times, finally an ashless white body was obtained, which was soluble in alcohol, ether, chloroform, acetic acid, etc., and to which the name dammarolic acid and the formula $C_{56}H_{80}O_8$ were given. From experiments it seems to be an oxy-dicarballylic acid. The ethereal solution yielded on evaporation an indifferent substance, to which the name alpha-dammar-resin ($C_{11}H_{17}O$) was given.

The material remaining in the extractions apparatus (insoluble in alcohol) was soluble in chloroform only, and its deportment being that of a resin, it was named beta-dammar-resin.

The analysis was as follows:

	Per cent.
Dammarolic acid	23.0
Water	2.5
Ash	3.5
Impurities	8.0
Alpha—Dammar Resin	40.0
Beta—Dammar Resin	22.5
Volatile oil, bitter principle	0.5
	100.0

CRITICISM OF KIPPENBERGER'S ASSAY METHOD FOR ALKALOIDS.—H. Beckurts and Frerichs (Apoth. Ztg., 916) after studying Kippenberger's method of analysis, offer a number of well founded objections. For convenience the assay method, as applied to extracts, is again repeated. The extract which is to be assayed is dissolved in warm acidulated water, filter if necessary, when cold render it almost neutral and then precipitate the alkaloids with the solution of iodine in potassium iodide. This latter solution is best prepared by dissolving from 12.7 to 20 gm. of iodine with about 60 gm. of potassium iodide in a liter of water. After settling, the precipitate is collected upon a filter, washed with cold water. As soon as the wash water runs through clear, the precipitate is dissolved in the smallest possible quantity of acetone, which is treated alternately with a solution of caustic alkali and an acid, then diluting with water, after which it is shaken with petroleum ether (30°—50° C.). The addition of caustic alkali solution serves to combine the free iodine as iodide and iodate and the acid decomposes the iodate into free iodine and a salt of the alkali. The agitation with petroleum ether serves to remove any impurities that may be present, also most of the acetone, however not even traces of the alkaloid are taken up by this solvent. The petroleum ether also serves to remove the traces of iodine, which are liberated on the addition of the acid to the iodate. This extraction by agitation is repeated twice and the mixed petroleum ether washings are shaken with a small quantity of acid diluted water which is returned to the original solution. The mixed acid aqueous solutions are slightly warmed to remove the traces of dissolved acetone and petroleum ether, then a few drops of —— solution of sodium hyposulphite added, followed by an excess of sodium carbonate solution, the whole being then shaken with either chloroform, ether or a mixture of both, which extracts the alkaloid. Emulsions of the chloroform frequently result during agitation; these may be separated by warming or adding ⅛ its volume of ether. According to Kippenberger the precipitation of the alkaloids with iodo-potassium iodide should take place in a solution made feebly alkaline or neutral, in order to avoid precipitation of the proteins, which are precipitated from acid solution by iodine. Messrs. Beckurts and Frerichs find that no precipitation takes place at all in alkaline or neutral solutions containing extract of hyoscyamus or belladonna, while that obtained from extract of nux vomica is very voluminous and after standing for several days failed to settle. Filtration assisted by means of a pump failed, owing to the fineness of the precipitate which passed through the filter. Precipitation from acid solution was attempted, but was found to be impracticable, owing to precipitation of proteids. Of the extract of nux vomica, one gramme was dissolved in 100 cc. of warm water acidulated with hydrochloric acid; now, according to the directions, this should be filtered when necessary, the solution of the extract, whether made in water alone or acidulated, is never clear, hence when filtration was attempted a resinous residue remained behind on the filter; this introduces here an error through loss of material. The almost clear filtrate is directed to be neutralized with sodium hydrate till it retains but a vey slight acid reaction, then iodo-potassium iodide added (15 gm. I, 60 gm. KI, H_2O, 1 liter) in excess, a very voluminous precipitate resulted. This was allowed to stand 24 hours, the clear fluid decanted off and the precipitate transferred to an Allihn's tube, where the filtration and washing proceeded so slowly that even with a pump it required 24 hours before the fluid came through clear; with filter paper the filtration proceeded more satisfactorily. Again the authors found that this precipitate contained a large amount of inert extractive which was not removed by washing. The precipitate with filter (entire) was transferred to a porcelain dish and covered with acetone, it being impossible to remove the entire precipitate from the filter; the solution resulting was then filtered, washing the dish and contents several times with acetone, until the filtrate passed through colorless. The subsequent operations of washing with petroleum ether and extracting the alkaloids with chloroform from alkaline solution gave some difficulty owing to the formation of emulsions; however, the final results gave an amount of alkaloid short of that obtained by other methods, due to losses incurred by the repeated operations necessary. The alkaloid is not obtained in absolute pure condition as is claimed in the process.

With extracts of hyoscyamus and belladonna like results were obtained; as already stated no precipitate was obtained in either neutral or feebly alkaline solution, while from acid solution the precipitate was very voluminous and difficult to wash. This precipitate contained almost the entire amount of extractive; also after undergoing the purifying process of agitating with petroleum ether, the chloroformic alkaloidal solution contained as much extractive as the original aqueous solution of the extract and the isolated alkaloid was neither pure nor crystalline.

So with this method of Kippenberger nothing is gained by precipitation from alkaline solution, while precipitation from acid solution yields, after many operations, a solution as impure as the original extract. The authors are also in doubt as to what purpose the solution of the precipitate in acetone shall serve. According to Kippenberger, solution of the precipitated iodides in acetone serves to remove impurities; this was found not to be the case, as the entire precipitate dissolved in each instance. The precipitate can just as well be suspended in water and be treated alternately with caustic soda and an acid as in its acetone solution. The rest of the operations bring nothing new. With this method the alkaloids can only be titrated iodometrically, but as this presents no advantages over the acido-metric estimations nothing is gained.

ALSOL.—An aluminum—aceto tartrate.

BORALID.—A mixture of equal parts of boric acid and antifebrin, used in skin diseases.

GLYBOLID.—A paste prepared from equal parts of boralid and glycerin. Used externally as antiseptic.

ANTI-CHLORIN.—A mixture of basic formiate of bismuth, sodium bicarbonate and glucose, recommended as a remedy for anemia.

SAPONOLEIN.—A patented cleansing agent, which consists of a solution of an acid oleate of soda or potassa in ether, benzene or carbon tetrachloride.

NAFTALAN.—A brownish-black, unctuous preparation, which is said to be readily absorbed by the skin, and is recommended in treatment of various skin diseases. It is obtained from naphtha wells situated near Naftalan, Caucasus, and contains 97.6 per cent. of a viscid oil, 2.4 per cent. of a soda soap, besides sodium and potassium carbonates. Naftalan melts between 65° and 75°, and has an odor like that of ichthyol.

QUESTION BOX

The object of this department is to furnish our subscribers with reliable and tried formulas and to discuss questions relating to practical pharmacy, prescription work, dispensing difficulties, etc. Requests for information are not acknowledged by mail and ANONYMOUS COMMUNICATIONS RECEIVE NO ATTENTION.

Artificial Cider.

(J. K.) See this journal, August 13, 1896, page 214.

Cheap Perfume for Domestic Ammonia.

(J. G. S.) Oil of mirbane has been recommended where a cheap odor is desired. Other odors which have been suggested are those used by soap makers, as oils of cananga, kuri moji, cedar, sassafras, etc., or combinations of them. Just how much of each will be required must be determined by experiment.

Oil Jasquium.

(A. P. S.) wants information regarding the identity of the first named ingredient in the following prescription:

Oil jasquium	2 ounces
Tincture of opium; Chloroform, of each	1 ounce

Mix and bathe the painful parts once a day.

Can some one of our readers furnish the information?

Paint for Killing Lice on Animals.

(W. J. F.) We are not familiar with the preparation you name. The "Veterinary Counter Practice" recommends stavesacre as an effectual destroyer of lice on cattle if prepared by boiling ½ pound with a gallon of water and brushing well into the coat with a hard brush. A mixture of train oil 12 ounces, sulphur 4 ounces, and oil of turpentine 4 ounces, has also been of service.

Sol. Stron. Nit. Parv Juvals.

(C. E. G.) wants an explanation of the words "Parv Juvals," as written in the following prescription:

℞

Sol. stron. nit. Parv Juvals................℥iv

Paraf-Javal, not "Parv Juvals," is a French chemist, whose name has been adopted as a trade-mark for a certain brand of strontium salts, prepared by Rigaud and Chapoteaut, of Paris. E. Fougera & Co., this city, are the American agents.

Tasteless Quinine.

(W. A. C.) In the formula for this preparation, this journal, Jan. 7, 1897, page 15, quinine sulphate is decomposed by potassium carbonate, a basic quinine being formed, which is insoluble in the liquids of the mixture. It is, therefore, comparatively "tasteless." As you are aware, the bitter taste of quinine and its salts depends almost entirely upon their degree of solubility, the more soluble salts being more bitter than those not so soluble. Of all the salts of quinine the tannate is the nearest to being "tasteless." It is also the least soluble.

Mentholated Petrolatum for Catarrh.

(J. G. C.) The following is a typical formula:

Menthol	5 grains
Boric acid	30 grains
Petrolatum	1 ounce

Another preparation containing menthol and petrolatum and recommended in the treatment of catarrh is this one:

Powdered boracic acid	120 grains
Menthol	60 grains
Thymol	20 grains
Eucalyptol	10 minims
Bismuth subcarbonate	2 drams
Cold cream	6 drams
Petrolatum	6 drams

Dissolve the menthol and thymol in the melted petrolatum, cool and mix with the other ingredients.

Tincture of Benzoin and Water.

(G. B. H.) Tincture of benzoin cannot be mixed with water so that no resin will be deposited. A milky mixture may, however, be produced by using about 2 fluid drams to 8 ounces of water, preferably rose water. A very little resin is, of course, deposited, but it is easily mixed in again by a thorough shaking. As you are aware, this is the old formula for "Lait Virginal," and the precipitated resin cannot be removed without, in the opinion of believers in the preparation, altering its value.

Odorous Perspiration.

(X. Y. Z.) The following are recommended by Shoemaker:

(1) Oleate of zinc	½ ounce
Powdered starch	1 ounce
Salicylic acid	20 grains

Dust over the parts.

(2) Beta-naphthol	½ dram
Distilled witch hazel	4 ounces

Apply well to the skin.

(3) Powdered oleate of zinc	½ ounce
Powdered boracic acid	3 drams

Keep the surface constantly covered with the powder.

Cocaine and Liquid Albolene.

(A. D. and B.) failed to make a solution as directed in the following prescription:

Cocaine	20 grains
Albolene	1 ounce

Use as spray with an atomizer for cold in the head.

Cocaine is insoluble in albolene, as it is in all of the hydrocarbons of the marsh gas series similar to petrolatum of the Pharmacopœia. A solution may be made, however, by first converting the alkaloid into an oleate by means of oleic acid, and then adding to the albolene.

Cipadella (?)

(C. P. M.) asks what "cipadella" is? He does not mean "the seed." From the latter explanation it is probable that our correspondent has in mind cevadilla, although he does not so spell it. We cannot conjure up any other explanation. Cevadilla, or sabadilla, is the principal source of veratrine, U. S. P. Other alkaloids extracted from it are cevadine, cevadilline, sabadine and sabadinine, all of which may generally be found in commercial veratrine. Cevadilla is rarely used in medicine, though it is a powerful irritant, and occasionally used to destroy vermin in the hair.

Blood, Liver and Malarial Remedy.

(J. K.) The following formula contains sarsaparilla, cascara sagrada, cinchona, snake root and pepsin:

Fluid extract sarsaparilla	2 ounces
Fluid extract cascara sagrada	2 ounces
Fluid extract cinchona	2 ounces
Fluid extract snake root	1 ounce
Glycerite of pepsin, N. F.	2 ounces
Compound elixir of taraxacum, enough to make	1 pint

Mix the fluid extracts with six ounces compound elixir of taraxacum; allow the mixture to stand several days, and filter. To the filtrate add the glycerite of pepsin and enough compound elixir of taraxacum to makes 1 pint.

Literature on Incompatibilities.

(W. L. M.) The Era has many times published information on the subject of incompatibilities. To find these articles consult the various indexes under prescription difficulties and incompatibilities. For an extended list of incompatibilities see this journal, September 12, 1895, page 327. Then, too, nearly all works on practical pharmacy and dispensing devote more or less space to the subject. Some of the works you may profitably consult are the Era Dose Book, Coblentz's Hand Book of Pharmacy (second edition), Remington's Practice of Pharmacy (third edition), Caspari's Pharmacy, Art of Dispensing, etc. A thorough knowledge of chemistry is requisite to a true understanding of incompatibilities.

Liquid Finger Nail Polish.

(R. J. S.) The Era Formulary gives this one:

Sulphuric acid	5 drops
Tincture of myrrh	1 dram
Water to make	4 ounces

Mix.

First clean the nails with a stiff brush and soap, and then plunge them into the above mixture and hold them there for five minutes.

Most nail polishes, however, contain oxide of tin, and may be either pastes or powders. The following preparation has been found very satisfactory:

Oxide of tin	4 pounds
Carmine	¾ ounce
Oil bergamont	150 grains
Oil lavender	150 grains

Perfumes for Toilet Soaps.

(J. G. S.) The American Soap Journal several years ago published the following:

Brown Windsor Bouquet.

Oil lavender, Mont Blanc	4 pounds
Oil caraway seed	2 pounds
Oil thyme, red	1 pound
Oil rue	½ pound

Use 1½ pounds for 200 pounds soap.

Guimauve.

Oil thyme, white	2½ pounds
Oil lavender, Mont Blanc	5 pounds
Oil caraway seed	2½ pounds
Oil marjoram	2 pounds

Mix 1½ pounds for 200 pounds soap.

A New Combination.

Oil palma rose	2 pounds
Oil lavender flowers, strong	2 pounds
Oil lavender spikes, flowers	1 pound
Oil rue	½ pound
Oil anise	½ pound
Oil palommier	1 pound

Styptics for Cuts Caused by Shaving.

(W. H. L.) The majority of the preparations upon the market contains tannic acid, alum, subsulphate of iron or some other astringent substance which, when applied, will arrest local bleeding. Here are two formulas:

(1) Alum,
Nutgalls,
Gum arabic,
Gum benzoin, of each, equal parts.
Powder each separately, and mix.

(2) Alum,
Gum tragacanth,
Tannic acid, of each, equal parts.
Powder and mix.

Used to stop local bleeding, a little being sprinkled, or pressed on the part.

Monsel's solution or solution subsulphate or iron, is a liquid preparation some times used. It may be readily applied by means of a small pencil of glass or wood to the cut.

Paste Stove Polish.

(J. G. C.) The following will probably answer your purpose. (Any of them will, however, dry out more or less in time, depending on the exposure and other conditions):

(1) Plumbago	2 pounds
Water	8 ounces
Turpentine	8 ounces
Sugar	2 ounces

Knead thoroughly and keep in tin boxes. Apply with a brush.

Here are several other formulas:

(2) Mix 2 parts of black lead, 4 parts of copperas, and 2 parts of bone black, with water, so as to form a creamy paste. This is an excellent polish, as the copperas produces a jet black enamel, causing the black lead to adhere to the iron.

(3) Moisten plumbago with turpentine in which resin has been dissolved, to make it adhesive, and subject it to strong pressure in appropriate moulds.

(4) Plumbago made into a paste with sodium silicate or water glass. Must be brushed thoroughly after applying to the stove.

Face Powder.

(1) Talc	10 drams
Wheat starch	1 dram
Orris root	1 dram
Oil bergamot	1 drop
(2) Bismuth subnitrate	½ dram
Purified talcum	1½ ounces
Wheat starch	2 ounces
Gypsum	3 ounces
Triple extract fleur de lys	1 fl. dram

Mix intimately and pass through fine bolting cloth.

(3) Oxide of zinc	30 grams
Wheat starch	250 grams
Oil of rose	3 drops
(4) Talc (of the finest white grade)	38 pounds av.
English precipitated chalk	25 pounds av.
Powdered carbonate magnesia	10 pounds av.
Oxy-chloride bismuth	7 pounds av.
Corn starch	20 pounds av.
Acid salicylic (true)	43 grains
Oil rose (pure)	5 fl. drams
Heliotropine	½ ounce av.
Oil bitter almonds	10 drops

Triturate oils, heliotropine, salicylic acid with bismuth thoroughly, mix with balance and sift through bolting cloth.

Remedies for Indigestion.

(J. K.) Most of the preparations usually prescribed for what is popularly known as "dyspepsia" contain pepsin or some other of the digestive ferments. Various combinations of this character are furnished by the National Formulary, as the elixirs and solutions containing pepsin, compound powders of pepsin and pancreatin, lime juice and pepsin, wine of pepsin, etc.

However, lack of gastric digestion depends upon a great number of causes, and it is always a symptom, not a disease. Hare, in discussing this subject, says indigestion occurs during the course of short or prolonged fevers from atony of the gastric walls and glands, from lack of secretion of the proper character, from hypersecretion of mucus by the mucous glands, and by fermentative changes in the food, or as the result of any one or all of these conditions, and, lastly, because the food is unsuitable to the case, or is a kind difficult of assimilation, or is readily split up into effete products by the juices of the organ, and these in turn being absorbed produce toxic symptoms. Sometimes it is due to organic changes in the viscus, as carcinoma or ulcer, and sometimes to acute or chronic gastritis. In each of these states the treatment is, of course, different, because widely separated causative factors must be removed, and, therefore, the services of a competent physician should be secured to diagnosticate the case.

Easter Egg Dyes.

(O. O. S.) To obtain a red color, boil the eggs in a decoction of Brazil wood. In the same manner Persian berries produce a yellow, turmeric a brown and logwood a deep claret color. By adding potassium chromate to logwood, a black may be obtained. To dye blue, make the following solution:

Boiling water	2 pints
Ferrous sulphate	75 grains
Indigo, in powder	45 grains
Dry slaked lime	2½ drams

Mix together and stir every half hour for three or four hours; cover and allow to settle for about 12 hours. Decant the clear liquid and dip into it the eggs, already boiled, but still warm. The blue color appears on exposure to the air. Green is produced by the successive application of blue and yellow. Various shades of purple, violet, etc., are obtained from red and blue. A simple method for imparting variegated colors is to wrap the eggs in pieces of printed muslin, and to boil them thus in water; some times very pretty patterns are in this manner printed on the shell of the eggs. Aniline dyes are largely used, and are desirable because they do not need any substance to set them, this being accomplished by the albuminous portions of the shell. The following colors may be used: Red—Fuchsin, acid fuchsin. roccellin, Bordeaux, ponceau, eosin, erythrosin. phloxin. Blue—Alizarin blue, aniline blue, indulin. Yellow—Acid yellow R., tropæolin 000 (orange I.). Violet—Methyl violet. Green—Malachit green, also greens obtained by mixing the above yellow and blue colors. These dyes may be put up for sale in various forms. Small tablets, each containing a separate dye, may conveniently be made with some inert material after the process for making tablet triturates. Some operators prefer to make up a mass containing the dye, cutting it afterward into disks by means of a lozenge cutter. Or the dye, mixed with some adhesive or glutinous material, may be made to adhere to strips of pasteboard or little billets of woods dried and thus sold, the customer being directed to dissolve off the dye in hot water, afterwards dipping the eggs into the solution in the usual manner. We think a few experiments along the lines indicated will enable you to obtain a satisfactory method of procedure.

Waterproofing Canvas.

(Druggist) The following formulas are taken from the Era Formulary:

(1) Gutta percha, 3 parts, is dissolved in resin spirit, 9 parts, at a heat of 120° to 140° F., stirring occasionally.

(2) Grind 96 pounds of English ochre with boiled oil, and add to it 16 pounds of black paint. Dissolve 1 pound of yellow soap in 1 pail of water on the fire, and mix it while hot with the paint. Lay this composition, without wetting it, upon the canvas as stiff as can conveniently be done with the brush, so as to form a smooth surface; the next day, or the day after (if the latter, so much the better), lay on a second coat of ochre and black, with a very little, if any, soap; allow this coat a day to dry, and then finish the canvas with black paint. Additional formulas and processes are given in the authority quoted.

(3) Lowry's process: 2 ozs. soap, 4 ozs. glue, 1 gal. water. Soften the glue in cold water, and dissolve it together with the soap in the water by aid of heat and agitation. The cloth is filled with this solution by boiling it in the liquid for several hours, the time required depending upon the kind of fiber and thickness of the cloth. When properly saturated, the excess of liquid is wrung out, the cloth is exposed to the air until nearly dry, then digested for 5 to 12 hours in the following solution: 13 ozs. alum, 15 ozs. salt, 1 gallon water. It is finally wrung out, rinsed in clean water, and dried at a temperature of about 80° F. (27° C.)

(4) Cooley gives the following recipe for waterproofing, which appears to have the advantage of having been tried with success: A simple method of rendering cloth waterproof, without being air proof, is to spread it on any smooth surface, and to rub the wrong side with a lump of beeswax (perfectly pure and free from grease), until it presents a slight, but even, white or grayish appearance; a hot iron is then passed over it, and, the cloth being brushed while warm, the process is complete. When this operation has been skillfully performed, a candle may be blown out through the cloth, if coarse, and yet a piece of the same placed across an inverted hat may have several glassfuls of water poured into the hollow formed by it without any of the liquid passing through. Pressure or friction will alone make it do so.

(5) The following application is said to prevent rotting when put on canvas exposed to the weather. Dissolve a half pound of sulphate of zinc in twenty gallons of water, and then add one-half pound of sal soda. When these ingredients are dissolved, add one ounce of tartaric acid. The canvas should be soaked in this solution for twenty-four hours, and then dried without wringing.

NEWS OF THE WEEK.

THE PASKOLA CASE.

Testimony for the Defense Taken in Philadelphia on Jan. 11.

Another chapter was added to the history of the proceedings in the Paskola conspiracy case, Jan. 11, when J. K. Richards and Charles Case, the lawyers representing the defendants, F. B. McNeal et al., in the suit brought against them by A. J. White, Limited, for $200,000 damages, took testimony for the defense Monday, Jan. 11, in an office in the Girard Building, Philadelphia. The only witness examined was Prof. Henry Leffmann, Professor of Chemistry in the Woman's Medical College of Pennsylvania and in the Pennsylvania College of Dental Surgery, and chemist to the Dairy and Food Commissioner of Pennsylvania, which position he has held for about four years. For many years Dr. Leffmann has acted at the request of the Coroner and District Attorney of the county as an expert in cases of poisoning and all medico-legal investigations. He was the expert for the Commonwealth in the case of the Commonwealth vs. Goerson, in 1880, and also in the case of the Commonwealth vs. Whiteside. Both these men were tried for murder by poisoning. Dr. Leffmann was also the Commonwealth's expert in the recent and famous trial of the murderer Holmes. His examination was as follows:

Q. Were you engaged in your occupation as chemist during the year 1894?

A. Yes, sir.

Q. I will ask you if you made any determination of an article called Paskola during that year?

A. I did. I made some analytical investigations of the article sold as Paskola.

Q. I will ask you to state the result of your investigation of the package, Doctor?

A. The contents of the bottle were a somewhat thick, syrupy liquid of a pale, yellowish-white color, with a slight odor of sulphurous acid, such as comes from burning matches, and a slightly acid taste. The liquid was found to mix with water in any proportion, though somewhat slowly. My analytical examination showed that it consisted largely of a form of sugar called dextrose, and commonly known as glucose. There was no proteid, that is, albuminous materials present, at least not a quantity sufficient to show in the ordinary tests. If such albuminous bodies were present, they were in a very minute amount, escaping ordinary tests. I also found the sugar present in the liquid was decidedly increased when the liquid was boiled with diluted acid for a few minutes, which, in my opinion, indicated the presence of some intermediate product between starch and glucose. A test for starch itself showed that it was not present. There was a small amount of hydrochloric acid present, and also a small amount of sulphurous acid present. The results of this test led me to believe that Paskola was almost entirely composed of the products resulting from the conversion of starch under the influence of acid, such as are obtained in the commercial manufacture of glucose, and that there had been added to this a small amount of sodium sulphite, and a little hydrochloric acid. Just how these were added I could not determine.

Q. I will ask you whether you found any digestive ferment present in the package to which you refer?

No Evidence of Trypsin.

A. I made experiments to determine the presence of the pancreatic ferment called trypsin. I did this because on the label or on the circular accompanying the bottle, or on some part of the wrapper or covering, there was a statement that very hot water should not be used, since it might destroy the trysin, and I will spell this word, "t-r-y-s-i-n." That was the actual spelling, which I presumed was a misprint for trypsin, t-r-y-p-s-i-n. I know of no substance known to chemists by the name of "trysin;" but I know that there is a digestive ferment of great power and efficacy called "trypsin," occurring in the secretions of the pancreas. My experiments were therefore made with a view to determine whether this trypsin was present, and I made comparative experiments with known preparations from the pancreatic secretions, the commercial ferments derived from that source. The results of my experiments were that Paskola did not contain, or at least the sample I had, did not contain such substances. I did not get any appreciable result, the kind that trypsin would give.

Q. I will ask you, Doctor, whether you found a digestive ferment of any character present in the package you examined?

A. No. I made no further experiments at that time, but in a later investigation, when a statement had been published to the effect that Paskola contained pepsin, I

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[*WEEKLY.*]

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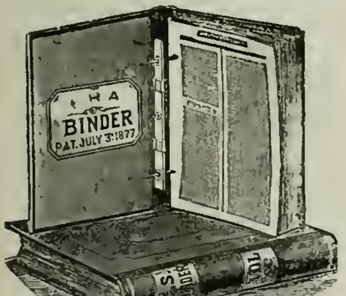

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Carelessness in Handling Medicines.

A Baltimore druggist has got himself into a peck of trouble by prescribing for a woman who complained of her poor appetite. After listening to her symptoms he gave her a box of pills containing pepsin, quinine, iron and nux vomica, which she took home and placed on the dining room mantel. Her baby boy got hold of the box, swallowed the pills and in less than twenty minutes was dead.

The Baltimore newspapers have opened the vials of their abuse upon the druggist, but it would seem to us that in this case the mother is to blame. It is true that the State law prohibits a druggist, unless he is a graduate of medicine from prescribing for a patient, and this is as it should be. The trouble arises when we come to define prescribing. It is unreasonable to suppose that people are going to pay a doctor every time they have an ordinary cold or a sick headache. It is equally unreasonable to debar a druggist from giving advice as to what medicine a sufferer from such trifling ailments shall take.

That the pills contained poison does not, to our way of thinking, prejudice the druggist's case one whit. It is not his business to find out whether the customers have children or not and warn them accordingly. In a general sense all medicines, even food, are poisons if taken to undue extent. Suppose that the child had drunk the contents of a bottle of eau de cologne and had succumbed thereto, would the druggist who sold the bottle be responsible for the death because he had not warned the mother that eau de cologne was not the best thing in the world for infants in arms? And, if not, why not?

No, the blame for this lamentable accident is clearly attributable to the careless habit of so many households in the keeping of medicines. It is a safe wager that if the box of pills had been furnished with all the blazonry of skull and crossbones in red, it would still have been put on the dining room mantel within easy reach of the children.

There is really nothing noteworthy in this Baltimore tragedy except inasmuch as it tends to lend force to a homily so often preached, so little listened to, that just alluded to. Every day in the year, in thousands of households all over the country, dangerous medicines are placed on the "dining room mantel," as it were, within easy reach of the children. It is a matter of wonderment that more tragedies of the kind to which we have made reference, do not occur. All the same there are far too many, and all the more pitiful because so easily preventable. But the way to prevent them is not by pounding the druggist. Reform the families.

The Right to Own a Drug Store.

Last July this journal reported the decision of a Philadelphia court, which found S. M. Zacharias guilty of violation of the pharmacy law. In reviewing and commenting upon the case we said:

"S. M. Zacharias was charged with operating or managing certain drug stores, of which he was owner or part owner, without being a registered pharmacist. He proved, and the prosecution admitted, that he carried on the business simply as a business, that he was not a druggist and did not pretend to be, but employed compe-

> tent and legally qualified men to make up prescriptions and sell drugs. He was, however, found guilty of violation of the law, which prohibits all persons except the personal representatives and widows of managers, who may carry on the business, from engaging in the business of selling drugs at retail.
>
> "This may be good law and in strict conformity with the provisions of the pharmacy act, but if the facts are correctly stated, and there are no incriminating features not brought out in the report, it would seem that it is exceedingly poor justice. It indicates a grave defect in the law (otherwise a wholesome one), which should be remedied by amendment. This man seems to have complied fully with the spirit and intent of the law, which was framed to prevent the handling of dangerous drugs by incompetent persons, but because of the unfortunate wording of the act he was found technically guilty and was punished accordingly. He suffers merely because he invested his money in this line of trade. The inconsistency of the law is apparent in the fact that it specifically permits the widow of a druggist to carry on his business without requiring her to know anything about drugs, but does not permit a man to carry it on by the aid of skilled employés. Until the law is amended, however, Mr. Zacharias' case will be a warning to unskilled persons who have money to invest not to engage in the retail drug business, in Pennsylvania."

That our position is not unsupported is shown by the fact that the Supreme Court, to which the case was appealed, has just handed down a decision reversing the judgment of the lower court, based on the ground of unconstitutional class legislation. Judge Smyth, in concurring with his colleagues on the bench, says among other things:

> "Whether the Legislature may, under the constitution, forbid ownership of the property mentioned in this statute, may be seriously questioned. The statute, however, does not forbid ownership. Nor does it forbid any person to open or carry on the business described, provided he do not act as manager. It merely forbids any unqualified person to open or carry on as manager the business in question, or to engage as manager therein. . . . The public are in no wise interested in the ownership of a drug store, or in its financial management. They are interested only in having that branch of its management affecting life and health, the sale of drugs, the compounding of prescriptions, etc., conducted by a properly qualified person. It is only this department of the business that the act assumes to regulate. The part taken by the defendant in the business, as found by the special verdict, was not within its prohibition."

The decision in this case is quite likely to supply a precedent for some other States, where laws similar to that of Pennsylvania are on the statute books. It has direct bearing upon the operation of drug and prescription departments in department stores.

COMMERCIAL SECTION OF THE A. Ph. A.

The American Pharmaceutical Association in Article I. of its constitution announces its objects and aims, which no doubt are sufficiently diverse and extensive to afford warrant for the institution of the section on commercial interests. Such section has been in existence eight years, but its history proves conclusively that it has not effected and cannot accomplish the ends for which it was established. The A. Ph. A. is a national organization, to foster and watch over the interests of its members and the profession they represent in a nation of great extent in geographical and all other respects. Throughout this great country the conditions obtaining with respect to the science and the art of pharmacy, its educational and legislative features, are practically the same, are uniform, and it is well within the province and power of the association to "foster, promote, improve and regulate" these interests.

But with the commercial interests of pharmacy, the business of the druggist, the case is very different. The commercial conditions prevailing in San Francisco are as widely separate in their nature from those existing in Boston as are these cities distant in geographical miles one from the other. A business problem which vexes druggists in one locality may never obtrude in another, or if solved in one section may be impossible of solution elsewhere. The A. Ph. A. has meddled with commercial questions, and without achieving one single useful result. It has accomplished absolutely nothing.

We believe this fact has become apparent to the clearer headed and most observant members of the Association, and that they agree with us that the section on Commercial Interests should be discontinued. The American Pharmaceutical Association is not a business organization. It should leave business matters alone. The task of Sisyphus was not more hopeless than the attempt of the A. Ph. A. to regulate the business affairs of its members. Every man takes unkindly advice in this line; he knows his own business best, and if one man cannot be "regulated," how impossible it is to regulate the business affairs of a number, and particularly when they are so radically diverse in nature.

The A. Ph. A. has given the Commercial Section a fair trial, and failed. It has tackled the cut-rate question, the alcohol problem and the like; has whereased and resoluted, and what is the result?—Let the section die, and henceforth let the energies of the organization be devoted entirely to the legitimate field in which it has accomplished so much in the past, and in which the work for the future holds promise and surety of success.

[Copies of the above were sent to a number of members of the A. Ph. A. ,with the request that they submit their views on the subject for publication. Following are the replies received up to date: It gives us pleasure to quote these opinions, the very divergence of which proves the need of consideration of this question.—Ed.]

* * *

Albert B. Prescott, Ann Arbor, Mich.: I believe the Association has done well to include within its aims the proper conduct of business relations and the protection of commercial rights in pharmacy. It is difficult to separate economics from ethics, and to leave out both would restrict the full usefulness of a national society of American pharmacists. In this respect the American Association is broader in its aims, but not always wiser in its practice than the British Conference. It is most mutually desirable to keep scientific work in touch with professional economics. But it is inherently more difficult to use wisdom in the discussion of the latter. Certainly there are inevitable limitations to success in the regulation of business interests by a body of business men. We should not refuse to recognize a task because it is difficult, neither should we spend time and patience in efforts which are at present quite impracticable.

I believe the Association should always be able to act upon business relations whenever it shall decide to entertain such action, but should exercise good common sense in avoiding fruitless efforts. Whether to continue to hold a separate section for business interests or not, is only a question of arrangements for the time being. At present the interest of the entire Association in the work of all the sections is so great that it has not been found expedient to hold meetings of more than one section at the same time. If the section of Commercial Interests be discontinued, then commercial papers and questions would belong in a general session, and, having been announced beforehand on the programme, would have about the same attendance of members which is obtained in meetings of the "Section." organized as such. The more vital question is, what sort of efforts toward regulation of pharmaceutical commerce shall the Association engage in at present. The majority of all the attending members, acting together at the meetings, should decide this question as prudently as they can.

In respect to the sale of "patent medicines" so called, I think it likely that the task of satisfactory regulation will be found to be beyond the power of pharmacists. As medicines and poisons sold without account of composition they are anomalous in pharmacy. On the one hand, none but a pharmacist should sell a medicine or poison. On the other hand, the public does not see why one tradesman can not sell a package of nameless poison in unknown quantity as well as another. It is the contradictory character of the "secrets" that has prevented the satisfactory regulation of their sale by pharmacists. They are an embarrassing burden to pharmacists, who, as a body, are not responsible for them. The Association has, at different times, by decided vote, unanimously or in large majority, given its own judgment against the use or the legal permission of sale, of secret medicines. But they are permitted by the public. And it is held to be the general duty of the pharmacist to supply such medicines as are properly called for by responsible persons, or ordered by physicians, without the intrusion of advice for or against the selection of a remedy. Not to pause here upon the limits of this duty, I simply repeat, pharmacists as a body are under embarrassment by reason of the "patent medicine" trade, an embarrassment which they have not brought upon themselves. And if the discussion of the cut-rate problem has yielded no other benefit to pharmacists, it has done, as I think, a good deal to open their eyes to their own professional interests in refusing to indorse the claims of nostrums.

There is one more thing to be remembered. It is the main benefit of the Association to bring as many members as possible together with each other for personal participation in as many discussions of common interest as may be. The acquaintance of members with each other is more than an incidental advantage. It is an education in itself.

* * *

H. M. Whitney, Boston, Mass.: My first thought was that you were a little hard on the A. Ph. A. and its members, when you so pointedly declare that "the task of Sisyphus was not more hopeless than the attempt of the A. Ph. A." * * * Was it kind, generous, or even courteous, to compare to Sisyphus, a fraudulent, deceitful, treacherous character, and his failure, the members or efforts of the A. Ph. A.?

My second thought was, that the writer of the editorial was a youth—a pessimist—forced from circumstances to get up something sensational, and that I had more important and agreeable work than discussing this question.

Upon a second reading and more careful consideration of the editorial, as requested, I became so impressed with what seemed to me the unjustifiable assurance of the writer of the editorial, and, particularly, as I see it, the unwarrantable claim that the "clearer headed and most observant members of the Association" agree with him, that I am forced to enter my protest—not that I claim to be one of "the clearer headed or most observant," but as a member urged to give his "candid opinion," I am compelled to say I have failed to find a single argument in the editorial—mere words and not facts, as I read them; misleading statements unworthy of an honest, fearless writer. What are eight years in a struggle for right, justice and public good, in which an average of fifty or less are waging war in which forty thousand or more are interested, and who from varied and local conditions are powerless to help themselves, unless aided and assisted by an organization?

Your declarations as to commercial conditions being so different, and that absolutely nothing has been accomplished, I meet with as positive a denial. You say "the educational and legislative features are practically the same, are uniform." As I read and am informed, there is as wide divergence as in the commercial. Is legislation of a purely scientific or educational character? Has it no bearing, and have the various trade organizations and the A. Ph. A. no power or influence in legislation for commercial interests? I venture the assertion if it were not for the social and commercial interests, the A. Ph. A. and many other useful organizations would be bankrupt. Our colleges of pharmacy, pharmaceutical literature, "editorials," boards of pharmacy even, simply and solely labors of love, scientific and without any commercial interests? How long would The Era and many other useful journals exist if it were not for the commercial side?

Strangle the "whereased and resoluted," "let the section die," as you demand, and in my opinion and judgment, instead of a star in the East, you would see a cloud in the West, feel a cyclone and witness a second burial.

Briefly, let all things work together for good—the scientist, the educator, the legislator, the commercial, and not the least, the social, giving all a share as they want and feel they need.

* * *

Thomas V. Wooten, Chicago, Ill: After reading your editorial an uninitiated person would conclude that the other sections of the national association had succeeded in settling definitely, permanently, and to the satisfaction of all concerned, every question referred to them, and by reason thereof deserved everlasting life. The Commercial Section, on the contrary, having convicted itself of inefficiency, of "meddling," of "working harm" and of general cussedness, deserved speedy consignment to eternal damnation.

The best friends of the Commercial Section will not claim that it has satisfactorily adjusted all the matters referred to it. Will the friends of the Section on Legislation and Education or the Section on Scientific Interests make this claim for their sections? The idea is absurd.

The statement that the section referred to "has accomplished absolutely nothing" is false. "It has tackled the cut-rate problem." Certainly it has, and it played an important part in proving to the world that the pretensions of the manufacturers that they wanted to protect the retail druggists of the country in obtaining full prices for proprietaries was a miserable lie. "It has tackled the alcohol problem." Undoubtedly, and it helped to save the pharmacists of the country from a competition with the manufacturers, than which nothing could have been more disastrous. In this matter, it has successfully defended the rank and file of the profession against those who (to place the matter in its most charitable light) failed utterly to apprehend that the pharmacist had any rights to be considered. "It has whereased and resoluted." It can not be denied, and one of the recent results of its whereasing and resoluting was the exposure of the methods of a sharper, whose scheme was to paste stickers on all patent medicines manufactured in order to compel the maintenance of full prices. By this action thousands of dollars have been saved to the pharmacists of the country, to say nothing of the humiliation of being defrauded.

It is proclaimed with a flare of trumpets that "the Commercial Section can not accomplish the ends for which it was established. It is denied that the truth of this statement has been proven. The history of the Commercial Section shows just the condition of things revealed by the history of the other two sections; namely, that much has been proposed which has not been accomplished, and the accomplishment of which was impossible. The objects of the A. Ph. A. are "to foster, promote, improve and regulate" the practice of pharmacy. In order to carry out this policy in its entirety it is difficult to see how the Commercial Section can be abolished. The pharmacist, in his commercial relations, has few real friends and no champions. The public press is against him, because his arch enemies, the cutters and the department stores, are liberal advertisers. The pharmaceutical press is lukewarm in its friendship, because the manufacturing pharmacist and the maker of the scientific (?) nostrum pay handsomely for "space," securing thereby immunity from interference with their interests. The invitation so cheerfully extended him to ask the national association to ignore, henceforth, his commercial interests is more likely to appeal to his sense of humor than his sober judgment.

It is not denied that the Commercial Section has failed to meet the hopes and expectations of its friends, but a discussion of the best plan to make the section efficient, to render it more helpful to the overworked, underpaid, discouraged pharmacist, on whom the sun seldom shines, and to whom good cheer is a feeling unknown, would be a more fitting task for a great journal like The Era, than an attempt to destroy that portion of the A. Ph. A., which seeks, through its far-reaching influence, to better the financial condition, and to protect him against shams, frauds and injustice.

* * *

W. H. Torbert, Dubuque, Iowa: I am against forestalling the judgment of the Association on any question that may come before it, either by editorials or by the less public effort of correspondence. I believe that the members of the A. Ph. A. are as bright and brainy as gather in any association, and will determine this question wisely when they assemble at their annual meeting. In other words, I am in favor of the A. Ph. A. being a deliberate body, deciding any questions that may arise on the arguments presented and their merits at the time the Association is convened, and I am willing to accept any conclusion which the members may reach on any subject as satisfactory to me. Therefore, I am unwilling to express myself on this question at this time. I recognize that your argument is not without force. I also contend that the Commercial Section has been of value to the Association and to the pharmacists of this country. I hope to be present at the annual meeting, and shall be glad to talk the matter over with you pro and con. If it transpires that we are to have a running discussion of this question through all the pharmaceutical journals, and take sides on the question before it is presented at the annual meeting, I may desire the courtesy of your columns to express myself; but for the present I shall not enter the discussion.

* * *

Isaiah A Solomons, of Solomons & Co., Savannah, Ga.: Replying to your inquiry as to my opinion of the proposed editorial suggesting the abolishing of the "Commercial Section" of A. Ph. A., I do not fully agree with you. As to your general idea that it does not result in any direct good on account of business interests of the country being so varied, I fully agree with you, but I consider that it is a feature of the Association that if properly managed can result in some benefit to the members by getting the ideas of those who have been successful, and this could be done by having a few practical subjects written about and discussed without any attempt at trying to influence legislation. The trouble is, there has been too much time wasted on subjects that can do no good.

* * *

From a long time and influential member, whose name is withheld. I prefer not to discuss the matter of which you propose to speak editorially; but I will say to you that your position is correct. The Association never was intended to entertain, promote or regulate the commercial interests of pharmacy, and the sooner the section on commercial interests is abandoned the better it will be for the "true interests" of the Association.

* * *

George W. Parisen, Perth Amboy, N. J.: I don't think I have sufficiently acquainted myself with the Commercial Section and its work to be able to judge of its being abandoned or continued. I quite agree with you as to each city, town or locality having different phases of the question to meet, incident to that particular place, and not affecting another in all ways the same, thereby making it impossible to formulate any one plan for all.

* * *

J. H. Redsecker, Lebanon, Pa.: I have no opinion to express on this question, as I have not given the matter that attention which it should have in order to give it intelligent expression. The Section has not accomplished much, if anything, since it was started. I think your editorial is temperate, and the subject one for discussion.

* * *

Joseph P. Remington, Philadelphia, Pa.: I, of course, have my views of the Commercial Section of the A. Ph. A., but inasmuch as I am a member of the Council, it would not be proper for me to express my opinion for publication.

* * *

Stanley E. Parkill, Owosso, Mich.: I have been in attendance at so few of the meetings that I feel I have no right to criticize the organization.

Cheap Prices.

Why is it that so many druggists display five and ten-cent goods, even one and two-cent articles, and push their sale; while the twenty-five-cent, fifty-cent and dollar goods are practically kept out of sight?

In last week's Era we printed a talk with a prominent manufacturer, in which he said:

> "Retail druggists should lend their assistance to any and every practical attempt to increase their profits. They must comprehend that cheap goods and cheap methods reduce the volume of the retailer's sales, and that the reduction is out of his profit. As a rule, people do not buy medicines because they are cheap, but because they need them, and they have more confidence in an article at a fairly good price than in one which is offered too cheap. It is a serious mistake, in my opinion, for druggists to push cheap goods. It is these cheap goods which have materially reduced the volume of the druggists' sales, and the sooner the retail druggists realize that it is to their own interest to push the sale of higher-priced articles, that moment will their profits increase, and their trade as a whole be in a much more satisfactory condition."

There is a principle hinted at in these words, which is a vital one. It is in the statement that cheap sales mean a reduction of profit. Instead of selling a ten-cent article, why not sell the customer a twenty-five or fifty-cent package. He will not buy any more than one, anyway, and there is little sense in letting him depart, leaving a profit of but a few cents, when it might just as easily have been made three or four times as much. The percentage of profit may be the same in both cases, but it is the aggregate upon which the druggist must live.

People buy medicine because they must, and a demand for medicine cannot be created and stimulated as is done in other lines of business.

Without unjustly and unduly imposing high prices upon his patrons, the druggist should exercise business common-sense in the sale of packaged medicines, sell those which are of sufficient size and price, to return a decent profit. But beyond medicines there is a field where he can legitimately develop this principle. Take the merchandise of the store's stock, for instance, the sundries, toilet articles, etc. Why sell a cheap hair brush or tooth powder when the same effort would sell a higher price article, rendering larger profit.

Cheap goods are unprofitable in all respects. Medicines and drugs cheap in price are cheap in quality; the same is true of cheap brushes. In both cases the customer is sure to be dissatisfied with his purchase, and his dissatisfaction is visited upon the druggist. Cheap goods mean a cheap druggist, and a cheap druggist is an abomination. The drug business is looked upon by the general public as a little higher, a little more respectable than other lines of business, and it is suicidal to acquire a reputation for cheapness. Push the good goods, the higher-priced ones, let the cheap-John stores keep the others, or if you must handle them to a certain extent, do not push them in the place of and to the detriment of the better.

The Abuse of Titles.

Debarred by the Constitution from becoming a lord or a "dook," the average American sovereign seeks consolation in a badge and a title. Of the manufacture of badges and the coining of titles there is no end. Kentucky colonels have passed into a by-word. Ohio has a general for every square mile of territory. New York is full of majors and lieutenants who sell groceries and drive street cars, and to have acted as arbiter on a dog fight, a cocking main, a horse race or a case of whisky, is sufficient to insure a man's titular election to the judiciary all over the United States. The title "Professor" has become the perquisite of champion horseshoers, fake hypnotists, dime museum performers, bad actors and pugilists of that class known as "mixed ale fighters." And to get down to the trade, what drug clerk is there so poor that none will do him reverence as "Doc"—if not, indeed, as full-blown "Doctor"?

All this must be very pleasing (?) to the genuine judges, generals, colonels, doctors and professors—men who have spent the better part of their lives working to honestly win those titles that the undeserving assume so easily and degrade so effectively. And, even in the case of a title legitimately obtained, there is small excuse for the owner flashing the handle before his name or the letters after it abroad to the world on a stereopticon sheet, as it were. The gods and little fishes laugh at such bad taste and peacockiness.

Some of these druggists are ingenious fellows, and they have an eye out for the main chance, too. There is one in a city in the interior of New York State. His store is a few doors from the corner of the street along which passes a line of trolley cars. Patrons who have used his store for a waiting place have many times not been able to get to the corner in time to catch the car. Now what did this druggist do? He ran a double line of wire from the store up to and above and across the trolley wire of the railroad company, and now when the cars pass the trolley pole raises the trolley wire, presses it against the special line, makes a connection and this rings a bell in the drug store. Any passenger who happens to be in waiting then has one minute to reach the corner and catch the car. The scheme is a good one, and is making friends and money for the druggist.

Guaranteeing a cure is a dangerous proceeding occasionally. One of the brood of Keeley institutes has recently been mulcted for damages for failure to carry out its agreement to cure a couple of individuals of the drink habit. If all similar failures to fulfill their guarantees were brought to court trial for damages, the profit and loss account of these institutes might suffer a reversal of figures.

TRIOXYMETHYLENE is recommended in place of formalin for sterilizing rubber surgical instruments, as the formaldehyde attacks rubber.

H. M. Seem, M. D.

Dr. Seem is one of those men who do an enormous amount of work and think nothing of it. He is the manager of details in Sharp & Dohme's New York office, under Ernst Stoffregen's direction. He reaches his place of business at No. 41 John street at 7:30 A. M., and leaves at 6 P. M. He keeps the office help employed. He notes the movements and the business done by forty-five traveling salesmen, supplying them with remittances and samples. He answers scores of letters daily from retail druggists all over the United States. He welcomes the out-of-town pharmacist, who has come down to New York for an outing, and he wins the visitor's heart in five minutes. He receives newspaper reporters, advertising agents and other unappreciated public benefactors, who esteem him their best friend. A man of such virtue deserves a monument.

Dr. Seem began life as a practicing physician. He was born less than forty years ago at Martin's Creek, Pa., and was educated at Lafayette College, receiving the degrees of A. B. and A. M. He graduated from the Jefferson Medical College in the class of '82. He practiced in Bethlehem and elsewhere in Pennsylvania until 1887, when he entered the employ of Keasbey & Mattison as a traveling salesman. He was afterward employed by Parke, Davis & Co. in a similar capacity.

Dr. Seem had always been fond of music, and was a composer, as well as a player, upon many instruments. He had also trained a number of brass bands, the Bethlehem Brass Band being especially successful under his leadership. About this time he tried the experiment of making his living as a publisher of music, but Sharp & Dohme heard of him and won him back to medicine in 1890. He became Mr. Stoffregen's assistant in 1892. He has considerable literary talent, and the house takes advantage of this in the preparation of their attractive circulars and advertisements, which are familiar to Era readers.

Dr. Seem is too busy a man to belong to a club, but he is not too busy to take healthy out-door exercise, and his favorite recreation is bicycle riding.

SALUBROL.—A bromated derivative of antipyrine-methylene, forms an inodorous, non-toxic antiseptic dusting powder.

Tax-Free Alcohol.

The following communication has been received:

Philadelphia, Jan. 15, 1896.

To the Editor: Agreeably to your request in the current issue of the Era, as well as your postal of this day, for direct information from the retail druggists of the United States on the subject of Tax-free Alcohol, I would briefly inform you of the sentiment expressed by the State as an association since the suggestion of the subject, by reference to the enclosed letters. The one letter explains itself and the other was mailed to each of my 400 fellow-members of the Pennsylvania State Pharmaceutical Association.

Needless to say, I have no negative replies to record, notwithstanding those unwarranted statements made recently in New York City, in which assistance was sought from this State by assuming those around us as New York, New Jersey, Ohio, etc., and which have since declared these statements without foundation.

Your course is very commendable and I hope your replies may be prompt and numerous, though I fear many may not do so, as having already sent their statement to the committee, from our suggestion in the circular letter.

There are plenty of progressive pharmacists in the United States, notwithstanding all the thralldom around them, and I trust they will grasp this opportunity, for the sake of their profession, to let themselves be heard. We have been "hitched, hampered and yoked" long enough. Now is our time to "break" all traces of such galling nature.

Personally, I thank you heartily for the privilege as a reader of the Era of conveying to the committee the same sentiments expressed to them by our committee of a few weeks ago, and I feel assured my fellow-members of the State association, as well as conferees of this city, will join me in wishing you unbounded success in this, as upholding the cause of true pharmacy in the United States. JOSEPH CRAWFORD.

The letter in which the feeling of the Pennsylvania State Pharmaceutical Association on the question of free alcohol was embodied, was one sent by the association's Committee on Free Alcohol to the Hon. O. H. Platt, chairman of the Joint Select Committee of Congress on Alcohol in the Manufactures and Arts. In this letter Mr. Platt's attention was called to the fact that at the annual meeting held at Mt. Holly Springs, June 16 and 18, 1896, the association placed itself on record as desiring tax-free alcohol for manufacturing medicinal preparations, and advocated that if at the present time a rebate of the entire tax was not feasible, at least a reduction of the existing tax should be made. It was pointed out that the removal of the tax on alcohol used by a nation's sick and distressed would undoubtedly reduce the cost of medicines to the consumer, and that the increase of tax, 20 cents per proof gallon, made by the customs law of 1894, has been borne entirely by the retail druggist on all alcohol which he has since consumed in manufactures. The committee favored the adoption of a plan of rebating the tax on alcohol after it has been used, as originally provided for in Section 61, of the laws of 1894. Such a plan would make easy the framing of simple regulations that will be acceptable to all manufacturers, be they large or small, and at the same time protect the government from loss by fraud. The opinion was also expressed that the danger arising from the recovery of alcohol from medicinal preparations to be used as a beverage, has been largely exaggerated.

The circular letter mailed by this same committee to the members of the State Pharmaceutical Society, urged the recipients to strenuously exert themselves in the obtaining of alcohol free from taxation or in bringing about a considerable reduction in the present excessive tax.

The Alumni Report of the Philadelphia College of Pharmacy for this month contains a lengthy paper by George M. Beringer, chairman of the College Committee on Alcohol Legislation, on "The Interests of the Drug Trade as Represented and Misrepresented Before the Joint Select Committee of Congress on Alcohol in the Manufactures and Arts."

In Mr. Beringer's paper are incorporated in full the paper submitted by Edward H. Hance to the Congressional Committee on behalf of the National Wholesale Druggists' Association; the communication of the Committee on Alcohol Legislation, of the Philadelphia College of Pharmacy, to Mr. O. H. Platt, chairman of the Congressional Committee, and the letter, to which we have just referred, written to the same gentleman by the chairman of the Committee on Alcohol of the Pennsylvania Pharmaceutical Association.

In these three communications are comprised—to follow the title of Mr. Beringer's paper—the "interests of the drug trade as represented" before the Congressional Committee. The "interests of the drug trade as misrepresented" are to be found in the argument made by Geo. P. Engelhard before the Joint Committee of the House and Senate on the Alcohol Tax, on Dec. 3, 1896. This argument is reprinted in full by Mr. Beringer from the Western Druggist, the journal of which Mr. Engelhard is owner, and then comes the real aim and end, the gist of Mr. Beringer's paper. For, after letting Mr. Engelhard state his arguments as best he knows how, Mr. Beringer proceeds to take those arguments one by one and pulverize them. The extent and success of the pulverizing process may be best judged from the following extracts from Beringer's reply to Mr. Engelhard:

"Mr. Engelhard is the publisher of the Western Druggist, and it is a sad commentary on the American Pharmaceutical Association that on a question of such vital importance to the business interests of pharmacy the association should not be represented by retail druggists who are recognized as prominent in the business of pharmacy. Surely a few such remain in the membership.

"But there are certain very broad and bold statements in the paper of Mr. Engelhard, which must be refuted. The desire of the Congressional Committee was to 'receive the fullest information,' and this should not be imposed upon by submitting statements, even if only of a rhetorical character, not warranted by facts. The statement that Mr. Engelhard represented 30,000 of the retail druggists of the United States is simply preposterous, and I am surprised that some 5,000 or 6,000 of us small fry escaped his drag-net. The membership of all the pharmaceutical associations in the United States will not number one-half of 30,000 retail druggists. The total membership of the American Pharmaceutical Association aggregated 1,558, according to the official figures at the last annual meeting. Deducting from this number the Canadian and other foreign members, and the editors, teachers, manufacturers and wholesalers, and the membership will not represent over 3 per cent. of the retail druggists of the United States.

"In reply to the statement that he was 'not authorized to speak for 30,000 out of the 35,000 retail druggists in the country' (the Western Druggist says), it is but necessary to state that he presented credentials showing his authority to speak for the committees named, who presumably were authorized to speak for the various associations, who, in turn, no doubt, reflected the majority sentiment of the druggists in their respective States.' This clever attempt at explanation is paralleled only by the tale of 'The House that Jack Built.' Perhaps, as he has not been enabled to take the whole in, he thought he would pull the hole in after him!

"A search of the proceedings of the American Pharmaceutical Association, for the years 1894 and 1895, fails to reveal Mr. Engelhard's name on any committee to which was referred the alcohol tax question; and, while the Proceedings for 1896 have not yet come to hand, in scanning the report of the proceedings of the convention in the pharmaceutical press, his name is not found to be mentioned in this connection. It is therefore, inferred that he was not officially delegated to represent the views of that association."

In order that no injustice might be done to Mr. Engelhard, Mr. Beringer, before preparing his paper, wrote the secretary of each State association mentioned by the former in his argument before the Joint Committee as associations represented by him, asking what official action, if any, had been taken by the association on the question of tax-free alcohol and alcohol legislation. Mr. Beringer has summarized in his paper the replies he received and "submits that the abstracts from the correspondence prove that Mr. Engelhard's claim to speak with authority for these State associations must be taken 'cum grano salis.' " Then he goes on:

"The statement 'that not a single State association favored the retention of Clause 61,' or, in other words, favored a rebate of tax on alcohol used in medicinal preparations, is rendered untenable by the recent action of the New York and Massachusetts associations, even if Pennsylvania had not, in June, 1895, already set an example.

"The American Pharmaceutical Association merits the support of every American pharmacist for its efforts in behalf of pharmaceutical sciences. Without intending any discredit on the association, the statement that 'the United States Pharmacopœia is edited and published under its auspices, as are all other publications of recognized official character relating to the practice of pharmacy in America,' must be refuted as either a willful misrepresentation or a pitiable exhibition of ignorance. Beyond the National Formulary and its valuable Annual Proceedings, we know of no publications emanating from this association. Does Mr. Engelhard not know that the United States Pharmacopœia originated with the medical and not the pharmaceutical profession?

"Mr. Engelhard argues that 'so long as the Government continues in need of revenue, and so long as intoxicating liquors and patent medicines—the twin evils of our civilization—continue, by common consent, as the proper objects of special taxation, so long must potable alcohol pay its full tribute.' What 'special taxation' of the Government is directed against patent medicines?

"Mr. Engelhard's arguments are largely based on the erroneous assumption that the retail druggists would not be included in the benefits of tax-rebate alcohol, and this is the stock argument that has been offered by those favoring the retention of the spirit tax.

"It is to be regretted that the American Pharmaceutical Association was so hasty in placing itself on record as opposed to the provisions of Section 61. The rebate of tax on alcohol after it had been consumed in manufacture was a new idea to Congress, the Treasury Department and to most manufacturers, and presumably also to the members of this association.

"That the action of the association in passing the resolutions at Asheville was not satisfactory is indicated by the discussion at Denver in 1895. The chairman of the special committee appointed to present the resolutions to the Treasury Department evidently had learned that many considered the action of 1894 as antagonizing the interests of pharmacy, and tried to have the following resolution adopted:

" 'That this association, in its action at Asheville, last year, on the question of alcohol, does not intend to say that the retail druggist is not in favor of free alcohol, whenever a law is passed that provides the giving to him of this free alcohol on such terms and conditions as he can make use of.'

"It has been repeatedly claimed that the Government would so construe any tax-free alcohol legislation as to require that manufacture be carried on in a bonded warehouse, or under such restrictions as would be impracticable for the retail druggist to take advantage of. It remains a fact that the Government has not committed itself to any such plan. On the other hand, the Government knows the necessity of adopting regulations that would be acceptable to all manufacturers, and both the Secretary of the Treasury and the Commissioner of Internal Revenue are opposed to any discrimination.

"The statement that the wholesalers were conspiring to have the laws so framed as to exclude the retailer, has never had any other foundation than blind prejudice, and it behooves our learned Western friends to now cast this opinion aside."

WHAT RETAILERS REALLY THINK.

Dr. George Ross & Co., Lebanon, Pa., send copy of a letter they recently sent to Hon. O. H. Platt: Dear Sir: Permit us to present our undivided protest against any method of making free alcohol for use in the arts and medicines which does not make it alike equitable to all. Any law that will enable one class of manufacturers to use free alcohol and compel others, because less extensive manufacturers, perhaps, to use tax-paid alcohol, would be manifestly discriminating and unfair. The retail druggist, to comply with the requirements of the Pharmacopœia, should be encouraged to make his own preparations, and should therefore have the same advantage afforded him by the Government, in the way of free alcohol, as is accorded to the large manufacturers. The plan of rebate on the alcohol used, as originally provided for in Section 61 of Act of 1894, is perhaps the fairest of all plans yet proposed. Under such plan every manufacturer, whether large or small, would be obliged to keep a record of the uses to which the alcohol had been put, and submit a copy of the amount, together with the cancelled stamps and affidavit. This, it seems to us, is the only equitable plan in which all would be placed on the same level.

W. L. Cliffe, Philadelphia, Pa.—After a careful consideration of the matter during the whole time it has been under discussion, I am thoroughly convinced of the desirability of tax-free alcohol for the manufacturing retail druggist. It is desirable because it will largely stimulate retail druggists to manufacture the great bulk of the galenicals and those chemicals in which the item of alcohol (due to wastage) figures largely in the net cost. The lessened amount of capital required will enable even the humblest pharmacist to become what he should be, and what the public supposes him to be—a manufacturer of the products he sells. On the other hand, if it became a question of the passage of a bill with conditions imposed which admitted only large pharmaceutical laboratories to its benefits, I would vigorously oppose the passage of such an act. It would not be equitable, and just as unconstitutional as the much-despised and repealed income tax. I trust that you will receive a volume of correspondence that will place the Era in a position to vigorously uphold the desires and rights of the retail pharmacist.

W. L. Thorpe, Hoosick Falls, N. Y.—If free alcohol is to be granted to manufacturers of pharmaceuticals, who are not engaged in retailing alcohol and alcoholic liquors, then the druggists must have free alcohol. If druggists do not and manufacturers do, the druggists will be obliged to buy all of their pharmacopœial and pharmaceutical preparations (those that are made with an alcoholic menstruum) which have always been made by the druggists. I do not believe it is advisable to grant tax-free alcohol to any person whatever, as fraud upon the Government is sure to be perpetrated, and with every one using taxed alcohol, all will be on an equal footing and injustice done to no one. However, if free alcohol is granted to any one, the druggist must have it, or be at a disadvantage that will ruin his business. I trust the druggists of the country appreciate the services of the Era, and although they may neglect to write you on this subject, they will be grateful if the Era shall be influential in bringing about a just and equitable solution of the problem.

Z. Ross, Boon, Mich.—For the Government to make alcohol free to manufacturers only would be an outrage upon pharmacists as well as the people. In this wise the manufacturer would compel the pharmacist to maintain a price for his goods which must satisfy this most avaricious greed at the same time. Our Government, which educates and authorizes us to do this work, entirely ignores us in our legal duty, outside the monopoly manufactory, not giving us an equal footing with the general stores, since the people at large do not expect nor ask by laws or otherwise from the general stores, as they do from druggists. Viewing the many other things which I have not mentioned, I am compelled to protest against the impartiality of such law, giving to the rich only that special privilege.

Gano & Costen, Norristown, Pa.—We think it would be a great injustice to the retail druggists of the United States for the Government to grant the manufacturers tax-free alcohol without extending the same privilege to the druggists. It would practically force all retail men to buy their preparations, such as tinctures, fluid extracts, spirits and liniments from the manufacturer, as they would be able to sell finished products for much less than the retail man would have to pay for his alcohol. We trust that no such imposition will be thrust upon us.

Julius Mayr, Chicago, Ill.—I do not want free alcohol for druggists, unless everybody else also gets free alcohol. Free liquors. Every inhabitant of the United States has the same right to alcohol free from tax as druggists and manufacturers have. The total abolition of Internal Revenue taxes which would put the prices of alcohol and whisky to 20 and 30 cents per gallon would be a blessing to our land, and would, to a great extent banish intemperance and drunkenness. Thousands of bad people and temperance fanatics would be compelled to work for a living.

J. H. Johnson, Eureka, Ill.—I believe it is all right to grant tax-free alcohol to manufacturers, but I think the retail druggists should be included, as they are manufacturers, only on a smaller scale. The retail druggists have been manufacturing their tinctures and other preparations largely for a great many years, and they are manufacturing them more and more each year. I have been in a retail drug store since 1875, a period of twenty-two years, and I see the necessity of druggists making their own tinctures and preparations more and more each year. If the Government granted tax-free alcohol wholesale druggists would undoubtedly be included, as they manufacture largely. If they are included, why not the retail druggist?

J. M. Lawrence, Cimarron, Kan.—I will say that if alcohol is made free to manufacturers, druggists should have it on the same terms. But I think that the law requiring druggists to pay a license of $20 should be repealed, and instead require them to pay on the gallon, as it is only the money that they are after. And then the man that sold one gallon would pay for one, and the one who sold 10,000 would pay for that quantity, and that would make it equal, but this robs one for the benefit of others.

F. A. Martin, Sharon Springs, N. Y.—I am an advocate of free alcohol for the drug trade. I do not think we should be taxed on alcohol. You ask if the retail druggist wants cheaper alcohol? Yes we do. Then we can compete and make our own preparations. While we have to pay the tax most of us poor druggists have not the capital to buy alcohol in quantities, and there is where the large manufacturer has the advantage over us.

G. W. Henry, M. D., Camden, N. J.—I am in favor of free alcohol. I desire to add my protest against the Government granting tax-free alcohol to manufacturers without allowing the same privileges to the retail druggists. I think it unjust to tax alcohol so high for druggists' use, because it affects every poor man with a family to support, because he gets so little for his money. To tax alcohol is a great injustice to druggists and physicians.

R. J. Parker, Monett, Mo.—Free alcohol? No! It will be practically impossible for the small retailer to obtain its benefits, and his manufacturing must cease. Easy pharmacy means increased competition. Stocks on hand would be depreciated—prices further demoralized. I think no method can be devised to secure revenue from beverage sales, while giving tax-free alcohol for manufacturing use, and the interests clamoring for tax-free alcohol for export only. We need the Era's help.

George Doughton, North Wilkesboro, N. C.—I think it would be a great injustice to the retail drug trade to allow free alcohol to wholesale druggists and manufacturers, and not allow the same privilege to retail druggists. In fact, the retail men are all manufacturers on a small scale and should have the same privileges and protection as the large dealers and manufacturers.

J. P. Zipf, Grass Valley, Cal.—Have tax on alcohol at $1.60 per gallon; give rebate to manufactured articles containing alcohol which are exported, or in which alcohol is used in their manufacture. The general public will derive as much benefit from a $1.60 rate as from free alcohol, while the Government will be ahead financially.

W. Dearden, Trinidad, Col.—If the manufacturers get free alcohol, of course the retail druggists need it too. Otherwise, we shall be mere handlers of goods. It will not pay us to make our own tinctures, or any preparations into which alcohol enters. It is merely a question of degree. We are all manufacturers more or less.

L. A. Phelps, Saugatuck, Mich.—I can heartily make a protest against tax-free alcohol that will not give me the same privilege that my neighbor has, simply because he manufactures on a little larger scale than I do. I have studied this matter a long time, and fail to see where I would be benefited by free alcohol.

Frank P. Moody, Lowell, Mass.—In compliance with your request for the sentiments of retail druggists, for one, would say, with regard to free alcohol, that I agree with "We firmly believe that if the large manufacturers have tax-free alcohol the small retailers want the same privilege"—your position in the matter.

R. F. Redington, Troy, Pa.—Am opposed to tax-free alcohol for the druggist, for, as Deacon Bedott said, "We are all poor critters," and there is no question that several of us would have a decided advantage in the retailing of the stuff for medicinal and mechanical purposes only.

Mrs. M. A. Jones, East Cambridge, Mass.—I don't think it would be just of the Government to grant tax-free alcohol to manufacturers and not allow the same privilege to retail druggists. If the manufacturers get tax-free alcohol, I think that the retail druggists ought to also.

Lee & Riley, Climax, Mich.—We are opposed to tax-free alcohol from end to end, from side to side, from top to bottom, to the largest manufacturer, to the pharmacist, to the retailer. If the tax is legitimate (and it is), let every one that handles it pay his share.

J. S. Walters, Nappanee, Ind.—I surely think we ought. There is no reason why the rich manufacturer should have this advantage over his less fortunate brother with fewer dollars, who really does the work. There is too much class legislation.

D. E. Thomas, Centre, Ind.—I cannot see the consistency in legislating in favor of manufacturers and against retailers. I would call that class legislation. No, I am opposed to tax-free alcohol for manufacturers, without including retailers also.

Wells & Nash, Greenfield, Mass.—It is impossible to make too strong a protest against allowing manufacturers the privilege of tax-free alcohol, without granting the same rights to the retail dealers. It would be simply a case of legal persecution.

John E. James, Good Hope, Ill.—In answer to your inquiry concerning the Government's granting tax-free alcohol to manufacturers without allowing the same privilege to retail druggists, I must enter a sincere protest against such discrimination.

J. M. Jones, M. D., Fountain City Pharmacy, Daytona, Fla.—I do heartily protest against tax-free alcohol to manufacturers without the same privilege to retail druggists; also against druggists having to pay license to sell alcoholic liquors.

C. L. Clawson, M. D., Chester, S. C.—I believe that all druggists should have free alcohol, as it will cheapen medicine for the poor—a matter of necessity—for in this country there are thousands who can't buy the medicine which they need.

U. D. and F. E. Bristol, Lapeer, Mich.—We most earnestly protest against any legislation in favor of free alcohol for large manufacturers, unless the same can be granted to the retail dealer and small manufacturers.

Stuben Drug Company, Wayland, N. Y.—We are in favor of alcohol being tax free for all medicinal purposes, and do not believe that it should be made tax free to manufacturers, unless it is also made free to retail druggists.

Winslow B. Morse, Indian Orchard, Mass.—I would like "Free Tax Alcohol" if we can have one gallon free or one hundred barrels, but no such discrimination as that of two years ago. Tax or no tax for all.

J. M. Stetson, Neponset, Ill.—All retail druggists ought to have alcohol free of tax for all mechanical and chemical purposes. Hope your journal will do what you can for the good of all retail druggists.

William Crooker and F. W. Schaffer, Montevideo, Minn.—We are strictly opposed to the Government granting tax-free alcohol to manufacturers, without allowing the same privilege to retail druggists.

J. J. Raulison, Siloam Springs, Mo.—I believe it is just and right to grant the same privilege to each. If one has free alcohol the Government must let the retail druggist have the same privilege.

F. A. Martin, Proprietor, Sharon Springs Pharmacy, Sharon Springs, N. Y.—I fully agree with you in regard to free alcohol. If the large manufacturers have it, why not the smaller dealers.

R. C. Hampton, Indianapolis, Ind.—I want to raise my voice in protest against our Government granting tax free alcohol to manufacturers, without allowing the same privilege to retail druggists.

Henry N. Jenner, Goshen, Ind.—I am not in favor of a law making alcohol free for manufacturing purposes. I think it would be better to reduce the tax to all rather than give a few an unfair advantage.

Dr. A. R. Bodley, Minneapolis, Kan.—I want free alcohol. I don't know of a single druggist that don't want it, and the fellow who lied before that committee should be pickled in alcohol.

James Piper & Co., Gorin, Mo.—We are strictly in favor of free alcohol to retail druggists. If the large manufacturers have it free we ought to have the same privilege.

T. J. Casper, M. D., Springfield, Ohio.—I certainly want free alcohol, and do protest against granting it to manufacturers without allowing same privilege to retail druggists.

J. S. Black, M. D., Virgil, Kan.—I am opposed to the Government granting tax-free alcohol to manufacturers, unless the same privilege is allowed the retail druggists.

Deems & Raber, Laud, Ind.—We are not in favor of the Government granting tax-free alcohol to manufacturers, unless the same privilege be extended to druggists.

M. L. Blatherwick, Centre Point, Texas.—I firmly believe that if the large manufacturers have "tax-free alcohol" the small retailer should have "tax-free alcohol" also.

F. D. Dempster, Milford, Ill.—I protest against the Government granting tax-free alcohol to manufacturers, without allowing the same privilege to retail druggists.

Abraham Hare, Belleville, Ohio.—I hereby enter my protest against the tax-free alcohol to manufacturers, without the same privilege to the retail druggist.

E. M. Johnson, Cloquet, Minn.—If the large manufacturers are allowed free alcohol, I think the druggists ought to be allowed the same privilege.

F. A. Curtis, Cochranton, Pa.—I am in favor of the Government granting tax-free alcohol to retail druggists as well as to manufacturers.

J. Beach, Marsland, Neb.—I am opposed to free alcohol to manufacturers, unless it can be had by druggists also.

Henry L. Scherb, Los Angeles, Cal.—I am in favor of free alcohol to druggists, if it is made free to manufacturers.

John W. Miller, Dayton, Ohio.—Manufacturers of tinctures, etc., who use alcohol can afford to pay tax on alcohol.

L. E. Emmons, Spencer, N. Y.—In response to yours in the Era I say, "We want free alcohol."

C. J. Schmelz, M. D., San Francisco, Cal.—We want free alcohol.

H. J. Jackson, Pullman, Wash.—I want free alcohol.

Correspondence.

We are pleased to publish here communications from our readers on topics of interest to the drug trade. Writers are requested to express their views as briefly as possible. Each article must be signed by its writer, but his name will not be published if so requested.

The Substitution Question.

Terre Haute, Ind., Jan. 12, 1897.

To the Editor:

I have with great interest followed the wail about substitution and do really not know what to think of it. I have been as pharmacist employed in several sections of this great country of ours and have always found that the one crying the loudest about substitution was the very one practicing it. Besides, my observations have proved to me that the heaviest cutters and those doctors who conduct drug stores in connection with their practice are more or less guilty of that charge. Of course there may be, and certainly are, exceptions, but I have failed yet to find them. I have always found the progressive pharmacist and the ideal pill-roller free from such practice, so far as my observations went. There is a very simple way to stop all substituting, if a physician is really afraid that his druggist might practice it. If a physician is compelled to prescribe a proprietary preparation, he certainly must (or should) know its composition: why not prescribe the crude drugs, etc., and have the pharmacist compound it? He is, according to his experience and education, as well, if not better, qualified than that manufacturer to compound the prescription. At least, I have not the least trouble to duplicate any proprietary article on the market, wherever the formula is published by the manufacturer. Besides, I often find that my preparation never has failed me where it was indicated, while I sometimes do not get the expected results from the original article. And it is always a great consolation for me to know exactly what I am dispensing. As most of the better preparations of that class are contained in the National Formulary, there is no reason why physicians should not prescribe these preparations as directed in that little vade mecum of the modern pharmacist. As physician and as pharmacist I can, and must, say, do away with prescribing preparations of which we know nothing, and in regard to those few which have the formula printed on the label, use similar preparations of the National Formulary, and you will have no cause whatever to cry about substitution, and are always certain of the quantity and effects of your medicine. X.

Cutting in the Drug Business.

New York City, Jan. 15, 1897.

To the Editor.:The timely article in your current issue with the above heading should bring many of the nearby bankrupt drug store proprietors and others to their senses. Yet, I very much doubt if it will do so, as these business men—"God save the mark"—imagine they draw people into their stores, and perhaps they do. Yet how many of these so-called owners of drug stores in this city to-day can honestly say they actually own them? I happen to know for a certainty that hundreds of these disgraceful cut-rate stores are overladen with debt, past redemption, and all of them, these cut-rate stores, I mean, are borne down by catering to the people who will walk two miles to save three cents, and ride six or eight to save ten. In this upper part of the city, called

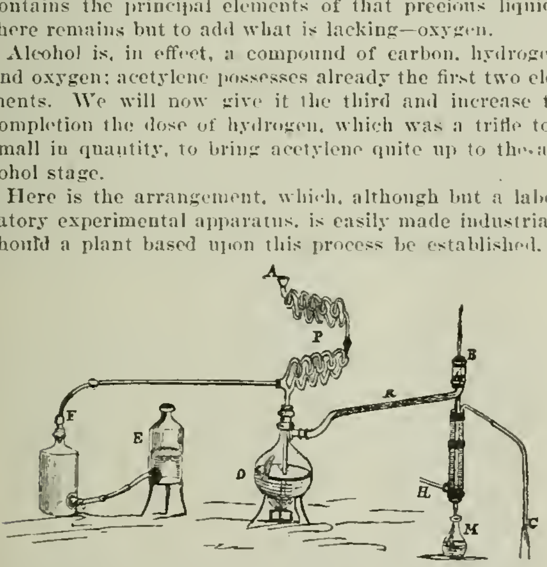
Harlem, from its beginning to end, we have hundreds of such stores, indeed many of them burst up, as they deserve to do, or change hands every few weeks, solely because their neighbor, Max Guggenheimer or Schmittenberg in the next block is determined to close the doors of his hated rival, Catchem, Cuttem & Co. They are today selling goods which they never paid for, or have bought them from some one who can steal them, as no one to my knowledge can sell patent medicines and pay their honest debt on a profit of 1 or 2 per cent., and in many instances 5 per cent. less than gross lots are quoted. You, Mr. Editor, know as well as your readers, that these are facts, indisputable truths. I have before me a book of prices issued by a store on Eighth avenue, above 125th street, in which many goods are quoted at retail much below wholesale list prices. Presumably, I will not handle any patent medicines, no matter what the demand may be, unless I can obtain a reasonable, yet small, profit. If the manufacturers will not, or cannot, protect the honest retailer from these infamous cut-throat idiots in the drug business, I, for one, will not bankrupt myself, simply because my next door neighbor is rushing into ruin at break-neck speed. A well-known sub-post-office in Harlem, and scores of others tried the cutter-to-death practice a few months ago and died a natural death only last week. Verdict: Served 'em right. These cutters, nearly all Germans, I am ashamed to say, are the greatest offenders, and I very much fear that no sense of honest trading exists among the majority of them. They seem determined to make a once honorable calling a by-word and disgrace in the eyes of the American people, who even now look upon drug stores as places kept to supply every sort of information desired, and all goods and postage stamps 50 per cent. off cost price. Very respectfully, yours, a determined opposer of dishonorable trading. C. C. C.

ABSOLUTELY PURE ALCOHOL FROM ACETYLENE GAS.

Acetylene, already so much spoken and written of as an illuminant, threatens to introduce itself in the confection of liquors. This use of it may, at first, appear but little appetizing, when its disagreeable odor is considered, but we hasten to say that care is taken to transform it into alcohol, for it is a gas which contains the principal elements of that precious liquid: there remains but to add what is lacking—oxygen.

Alcohol is, in effect, a compound of carbon, hydrogen and oxygen; acetylene possesses already the first two elements. We will now give it the third and increase to completion the dose of hydrogen, which was a trifle too small in quantity, to bring acetylene quite up to the alcohol stage.

Here is the arrangement, which, although but a laboratory experimental apparatus, is easily made industrial, should a plant based upon this process be established.



Apparatus for Making Alcohol by Means of Acetylene Gas.

F. Flask containing calcium carbide and scrap zinc. E. Water acidulated with sulphuric acid. A. P. Glass worm in which hot sulphuric acid circulates. D. Flask to collect and distill ethylsulphuric acid. R B. Worm for condensing vapors of alcohol. M. Flask for the pure alcohol, condensed. H. C. Liebig condenser.

In a flask, F, calcium carbide and metallic zinc are placed; knowing that zinc, when attacked by water acidulated with sulphuric acid, gives hydrogen gas in the presence of water, we see here that the calcium carbide freely evolves acetylene gas. In the flask, E, put, then, water and a little sulphuric acid and connect this flask with the first by a flexible tube, so that, when E is elevated or lowered, we may introduce or withdraw, at will, liquid in the flask, F, according to the need of the production.

The acetylene and the hydrogen, developing at the same time, do not fail to seize the opportunity for combining. In the nascent state bodies always have a greater affinity for each other than at a later stage.

It is of this marriage, then, that the ethylene is born, which, being now disengaged, goes over into the glass worm, P, where it comes in contact with concentrated sulphuric acid heated to 80 degrees C., which is slowly poured into a funnel, A; it is here that it gets its oxy-acid. This is collected in the flask, D, and is brought to ebullition. Here it is decomposed into sulphuric acid, which remains, and may be used again, and into alcohol, which evaporates, but is collected and condensed by means of tube, R, connecting with worm, B, surrounded by a current of cold water circulating from H to C.

In M is collected an alcohol absolutely pure,* which industrially produced would not cost more than 20 centimes (4 cents) per liter. It contains none of those essences which are always present in the vegetable alcohol, and which render them dangerous for consumption.

It is not a little curious that alcohol furnished in large quantity by the vegetable kingdom is now going to be given us by the mineral world, and at a ridiculously low price. It would seem that in combating alcoholism we are going against the laws of nature. After all, we had best conclude that if Dame Nature thus places alcohol in profusion within our reach, it is not to take the place of water as a beverage. (From Le Monde Moderne. Translated by J. Colton Lynes, Ph. D., ex-president Georgia Agricultural College, etc.; Scientific American.)

IS LIFE WORTH LIVING?

Benjamin Taub, of Brooklyn, Hardly Thinks Druggists Will Find it so Until they get Shorter Hours.

There has been much said and written about shortening the hours of druggists who are actually nothing more than a body of slaves—in some cases, highly educated and intelligent slaves, but slaves all the same who are toiling day and night for nothing more than their daily bread. What more do they have? Absolutely nothing, neither home comforts, which every common laborer enjoys, nor social pleasures. There is hardly one among so many thousands of so-called civilized druggists (who are actually living in a state of semi-barbarism) who can claim membership in any social, political or literary organization, such as is enjoyed by men of every other trade and profession.

The remedy for this great evil in our profession is not in talk, writing or opinion. But let those brave men who are advocating this much-needed reform put their words and ideas into practice by closing their stores at 8 P. M. every evening (Saturdays excepted) and Sundays at 12 M., and others will soon follow suit. Thus the corner-stone, to our ultimate success, would be laid.

The good that would follow such action cannot be overestimated. It would drag us out of our living tomb, elevate us to a higher social standing, give us time to enjoy domestic happiness, of which we are as yet en-

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*The chemistry of the process is not given in the original; it is, however, very simple. In flask F we have.

$$Zn + H_2SO_4 = ZnSO_4 + H_2.$$
Zinc + Sulphuric acid = zinc sulphate + hydrogen.
$$CaC_2 + 2H_2O = Ca(OH)_2 + C_2H_2$$
Calcium carbide + Water = slaked lime + acetylene.

At the instant of the above reaction this is formed:

$$C_2H_2 + H_2 = C_2H_4.$$
Acetylene + hydrogen = ethylene.

And in tube and worm, A. P., we have

$$C_2H_4 + H_2SO_4 \text{ (hot)} = \left.\begin{matrix}C_2H_5\\H\end{matrix}\right\}SO_4.$$
Ethylene + sulphuric acid = ethylsulphuric acid.

Which, being boiled in D, decomposes thus:

$$\left.\begin{matrix}C_2H_5\\H\end{matrix}\right\}SO_4 + H_2O + \text{heat} = C_2H_5.OH + H_2SO_4.$$
Ethylsulphuric acid + water + heat = alcohol + sulph. acid.

tirely ignorant, and last, but not least, it would be the opening wedge that would help to do away with the fatal evil called the "cut-rate."

To do away with this evil, which is slowly but surely dragging us down lower and lower, we must organize; but organization, under the present hours of labor is impossible. We have neither the time for it, nor the intellect. We have hardly time to sleep and eat, let alone discuss and organize, and our intellects are dwarfed by the long hours of confinement.

The druggist furnishes a remedy for every disease. Give him time and he will furnish a remedy for this dangerous and killing cutting of rates.

Some druggists may think that by closing at an early hour in the evening they will lose some of their trade. While this may be true in some cases, I have found that, as a rule, the trade after 8 P. M. consists chiefly in articles that could be bought either before the closing hour or the next day. As to emergency cases, let me tell you that almost every physician of to-day is prepared for such and carries with him such drugs as he may require in case of a sudden call. Those physicians who have not yet learned to be prepared for emergency cases will soon learn, once this early closing system be properly established, to be prepared for any and every contingency that may arise.

As regards the public. If we have once gained their confidence, which is the one great requisite for success, they will follow us wherever we are, and seek us at whatever hours we may choose to keep open, and so buy their drugs and medicines either earlier in the day or keep on hand a liberal supply of such drugs as they may need after the closing hour.

From a four months' careful observation in three of the largest prescription departments in Brooklyn I have found that there were only three calls in all that time for prescriptions which could really be called emergency cases. Even those three could have been avoided if the physicians in question had carried with them a small vial of Magendie's Solution, which every careful physician ought to have always ready for use in cases where immediate relief is necessary.

In conclusion I would say that by early closing we have absolutely nothing to lose and everything to gain.

BENJAMIN TAUB.

IS THIS THE OLDEST DRUG STORE IN AMERICA?

A Pennsylvania Pharmacy Founded 140 Years Ago by a Moravian Doctor.

The Era's quest for the oldest drug store in America has brought to light a pharmacy in Pennsylvania which was founded in 1756. This is the drug store of Simon Rau & Co., of Bethlehem, Pa. Bethlehem was settled by the Moravians in 1742, and Dr. Matthew Otto, the founder of this business, was a member of that society. The accompanying illustration is taken from a water color painting of the original building, which hangs in the office of the concern, which is located on the original site.

It is a singular fact concerning this store that there have been but three managers since it was established. Dr. Otto died in 1790, and was succeeded by Dr. Everett Freytag. Simon Rau, the present manager, became apprenticed to Dr. Freytag in 1830, and succeeded to the ownership of the store in 1840. He is now seventy-nine years of age, still hale and hearty, and attending to his duties in the store.

Mr. Rau has associated with him his son and nephew, Eugene A. and Robert Rau, aged, respectively, forty-eight and fifty-two. The business is a flourishing one, and is conducted in a modern building with the most improved appliances. It is said to be a storehouse of historical information, as the three proprietors personally observed many matters of the greatest historical importance in this country. Washington and Lafayette were visitors at the settlement, and Mr. Rau's own personal recollection takes in everything of interest in this country since before the Mexican War. He has seen commercial revolution brought to pass by the substitution of the railroad for the canal and the wagon road in transportation, and the telegraph and special delivery for the old stage coach postal service.

* * *

A good specimen of the antebellum drug store is to be seen at the corner of Delancey and Market streets, New York, conducted by Louis F. Roediger. It was founded in 1834 by a Mr. Winzer. The house, a substantial brick of uncertain antiquity, had been used only as a dwelling before that. The interior of the pharmacy has been entirely refurnished and modernized, but the exterior is exactly as it was in the beginning and is severely plain. Market street was an aristocratic thoroughfare in those days and the store has always been prosperous. R. Homann, who was proprietor in the fifties, put in the first soda water apparatus seen in that neighborhood, and made a great deal of money out of it. He used to gather in a half bushel of shin-plasters a day, and was accustomed to soak them in a tub of water overnight so as to get the syrup off them. The change that has come over the neighborhood in the character of its population is best illustrated by the fact that the sale of soda water no longer pays, owing to the competition of curbstone soda dispensers. Nevertheless, Mr. Roediger says that the old stand brings in more profit now than it ever did. It is known as Kraft's pharmacy.

ODONTINE.—Carmine (0.25) in fine powder, is thoroughly mixed with 15 gm. of prepared oyster shell (or levigated chalk), then combined with 4 gm. of magnesia carbonate, 45 gm. of talcum, 22 gm. of powdered Castile soap, 25 drops of oil of peppermint, 3 drops of oil of calamus and 3 drops of oil of cinnamon. This mixture is then beaten into a paste, with 15 to 20 gm. of glycerin and placed in porcelain containers or collapsible tubes.

QUANTITATIVE ESTIMATION OF ALBUMEN IN URINE.—To the sample of urine one-fifth of its volume of a saturated magnesium sulphate solution is added. It is heated to boiling, and after cooling to 60° C. a few drops of acetic acid are added. The precipitate is collected, washed and dried.

AMIDO-ANTIPYRINE.—Amido-antipyrine has been prepared. It forms pale yellow crystals which melt at 109° C., readily soluble in water, alcohol and benzene. Owing to the readiness with which this forms various additive compounds we may expect the list of antipyretics to be greatly augmented in the near future.

SHAVING POWDER.—Powdered soap, 500 gm.; powdered orris root, 30 gm.; oil of bergamot sufficient quantity.

QUESTION BOX

The object of this department is to furnish our subscribers with reliable and tried formulas and to discuss questions relating to practical pharmacy, prescription work, dispensing difficulties, etc. Requests for information are not acknowledged by mail and ANONYMOUS COMMUNICATIONS RECEIVE NO ATTENTION.

Kola Coca.

(C. O. T.) See this journal, June 6, 1895, page 716.

Brilliantine.

(M. E. S.) See this journal, July 23, 1896, page 113.

Composition of Tablets.

(M. U. R.) The crushed tablet you submit contains copper acetate and mercuric chloride.

Kumyss.

(A. R. B.) Several processes are given under this title, this journal, Dec. 17, last year, page 794.

Application for Chapped Hands.

(O. O. S.) See this journal, Aug. 13, 1896, page 213. Formulas for various toilet creams may be found in the issues of March 12, page 335, and Dec. 10, 1896, page 761, and Jan. 14, 1897, page 42.

Preparation of Tooth Pastes.

(A. M.) Glycerin is generally preferred to either honey or syrup in the preparation of tooth paste. It possesses antiseptic properties, and paste made with it is not apt to spoil or dry out so quickly.

Fake Prescription.

(J. F. R.) The formula you submit directing Arabian sea grass, Arabian Kanka root, etc., is the old fake which has been exposed time and again in the pharmaceutical journals. See remarks under the above title, in this journal, Aug. 6, 1896, page 179.

Machines for Gelatin-Coating Pills.

(A. M. L.) There are a number of machines for gelatin-coating pills upon the small scale. The following are described in most works on practical pharmacy: Maynard's, Patch's, Franciscus' and Wells' "Porcupine." J. H. Day & Co., Cincinnati, Ohio, manufacturers of pharmaceutical apparatus, may also be able to give you some information relative to the machines they manufacture.

Oil Jasquium.

(A. P. S.) In reply to your request for information, this journal, Jan. 24, 1897, page 78. John Pfeiffer, Brooklyn, N. Y.; Otto Boeddiker, and F. Frentz, New York City, state that by "oil jasquinm" is doubtless meant, "huile de jusquiame," the French title for "oleum hyoscyami" of the German Pharmocopoeia. A general formula for these oils (Olea Infusa), is given in the National Formulary, page 105, revised edition.

Compound Mixture of Chloral and Potassium Bromide.

(W. B.) The precipitation in the mixture you submit is due to the resin of cannabis indica, which is practically insoluble in the liquid of the mixture. Neither can it be wholly prevented. The National Formulary gives an approved formula (No. 261, revised edition) for this preparation in which the difficulty is somewhat overcome by the use of tincture of quillaja, which holds the resin in suspension.

Barbadoes Tar.

(O. O. S.) Barbadoes tar is a variety of petroleum formerly much employed. It is described as a black, nearly opaque, inflammable liquid, of the consistence of molasses, unctuous to the touch and possessing a bituminous taste and a strong and tenacious odor. Its sp. gr. varies from 0.730 to 0.878. When subjected to distillation, it yields naphtha and leaves a solid residue of asphaltum. Crude petroleum is generally dispensed upon orders for it.

Vermifuge.

(W. B.) The Era Formulary gives the following:

(1)	Oil chenopodium	1 ounce
	Alcohol	1 ounce
	Spirit ammonia, aromatic	½ ounce
	Essence gaultheria	2 drams
	Aromatic syrup rhubarb, simple syrup, equal parts to make	1 pint
(2)	Fluid extract spigelia	5 ounces
	Fluid extract senna	3 ounces
	Oil anise	10 minims
	Oil caraway	10 minims
	Syrup	8 ounces

Ethereal Tincture of Lavender.

(J. G. N.) We know of no specific formula for a combination of compound tincture of lavender and sulphuric ether. The following, however, has been prescribed as a remedy for hysteria and nervousness:

Compound tincture of lavender; compound spirit of ether, of each of equal parts.

Dose: One-third to two teaspoonfuls.

As you are doubtless aware lavender is a carminative, but it is rarely used, except in combination. A formula for "ethereal tincture of lavender," given in some of the older works, is oil of lavender 1 part; ether 7 parts. Dose—5 to 10 drops.

Sale of Domestic Remedies in Connecticut.

(T. J. C.) The pharmacy law of Connecticut does not prohibit "the keeper of a country store from keeping for sale and selling such domestic remedies as are usually kept and sold in such stores, but such keepers shall not compound medicines, and medicinal preparations so kept and recognized by the United States Dispensatory shall be compounded by a licensed pharmacist and marked by his label" (Section 3,126, General Statutes, 1888). Just what construction the Board of Pharmacy has put upon the words "domestic remedies" we are unable to state, but this information can be, no doubt, obtained from the secretary of the board, H. M. Bishop, New Haven. The law does not prohibit the sale of patent medicines by unregistered men.

Asthma Powder.

(J. H. B.)

(1)	Lobelia	1 ounce
	Black tea	1 ounce
	Stramonium	1 ounce
	Potassium nitrate	1 ounce
	Anise	1 dram
	Fennel	1 dram

Attention to the stomach will do most for many asthmatic patients. An important point is to take the heaviest meal early in the day, and very solid food after 2 P. M. Shower bath and out-of-door exercise, not, however, to a fatiguing extent, are serviceable. In special cases operative treatment of the nose and nasopharnyx is required.—(Mackenzie.)

(2)	Stramonium leaves, ground	4 ounces
	Fluid extract belladonna	2 ounces
	Tincture opium	2 ounces
	Pulverized saltpeter	3 ounces

Mix the powders thoroughly, add the liquids. Ignite small amount, inhaling the fumes.

Tincture of Iron in Pills.

(J. K.) Tincture of iron is rarely, if ever, prescribed in pill form on account of its comparatively large dose (10 to 30 minims), the resulting pill being too large for satisfactory administration. Besides, tincture of iron is generally recommended to be given largely diluted with water. Ferric chloride is readily decomposed by most vegetable substances possessing astringent properties, hence the difficulty in prescribing it in combination. Sometimes, however, mercuric chloride is combined with it to increase or give it a more distinctly alterative effect.

Pills containing ferric chloride may be made after the following formula suggested by McLaren (Pharm. Jour.):

Ferric chloride, anhydrous	3 grains
Powdered licorice	1 grain
Extract licorice	1 grain

For 1 pill. This pill is said to keep well, this advantage counterbalancing its size.

Waterproof Enamel Shoe Dressing.

(J. H. S.) The Era Formulary gives the following:

Caoutchouc	100 parts
Petroleum	100 parts
Carbon disulphide	100 parts
Shellac	400 parts
Lamp black	200 parts
Oil lavender	10 parts
Alcohol	2,000 parts

Upon the caoutchouc in a bottle pour the carbon disulphide, cork well and let stand a few days, or until the caoutchouc has become thoroughly gelatinized or partly dissolved. Then add the petroleum, oil of lavender and alcohol, next the shellac in fine powder, and heat it to about 50° C., taking care that as little as possible is lost by evaporation. When the substances are all dissolved and the liquid is tolerably clear add the lamp black, mix thoroughly and fill at once into small bottles.

(2). A waterproof blacking which will give a fine polish without rubbing, and will not injure the leather: 18 parts beeswax, 6 spermaceti, 66 turpentine oil, 5 asphalt varnish, 1 powdered borax, 5 Frankfort black, 2 Prussian blue, 1 nitro-benzol. Melt the wax, add the powdered borax and stir till a kind of jelly has formed. In another pan melt the spermaceti, add the asphalt varnish, previously mixed with the oil of turpentine, stir well, and add to the wax. Lastly add the color previously rubbed smooth with a little of the mass. The nitro-benzol gives fragrance.

Writing Fluid.

(W. P. L.)

(1) Powdered galls	42 ounces
Gum senegal	15 ounces
Distilled water	18 quarts
Ferrous sulphate	18 ounces
Water of ammonia	3 drams
Alcohol	24 ounces

Mix in an open vessel, stirring frequently until the ink attains the desired blackness. This formula is said to give a deep black neutral ink that does not corrode steel pens.

(2) Bruised Aleppo nutgalls, 2 pounds; water, 1 gallon; boil in a copper vessel for an hour, adding water to make up for that lost by evaporation; strain and again boil the galls with a gallon of water and strain; mix the liquors and add immediately 10 ounces of copperas in coarse powder and 8 ounces of gum arabic; agitate until solution of these latter is effected; add a few drops of a solution of potassium permanganate; strain through a piece of hair cloth, and after permitting it to settle, bottle. The addition of a little extract of logwood will render the ink blacker when first written with. Half an ounce of sugar to the gallon will render it a good copying ink.

(3) Calcined sulphate of iron	1 ounce
Powdered gall nuts	1½ ounces
Vegetable gum	½ ounce
Distilled water	1 pint

Digest until dissolved.

Remedy for Nervousness.

(J. K.) See formulas Nos. 36, 62 and 261 National Formulary. Here are two others taken from Fenner:

(1) Bromide of ammonium	1¼ ounces av
Valerianate of ammonium	¼ ounce av
Fluid extract of valerian	1 fl. ounce
Fluid extract of hyoscyamus	1 fl. ounce
Fluid extract of coca	1 fl. ounce
Syrup	2 fl. ounces
Simple elixir, enough to make	1 pint

Mix the liquids and dissolve the salts in the mixture; after standing 24 hours filter. Dose from a teaspoonful to a tablespoonful, as required.

(2) Bromide of potassium	640 grains
Sulphate of morphine	8 grains
Valerianate of ammonium	256 grains
Fluid extract of valerian	1 fl. ounce
Fluid extract hops	½ fl. ounce
Water of ammonia	1 fl. dram
Syrup	2 fl. ounces
Simple syrup, enough to make	1 pint

Dissolve the salts in the elixir and syrup; add the fluid extracts and the water of ammonia; let stand a day or two and filter. Dose, a teaspoonful to a dessertspoonful.

Here is a formula given by Howard in "Domestic Medicine" under the title of Well's Compound Tincture of Valerian or Nervine:

(3) Valerian root	7 ounces
Licorice root	5 ounces
Oil of anise	1 ounce
Gum camphor	1 dram
Alcohol	1½ pints

Macerate the solid ingredients, previously powdered, and the oil of anise in the alcohol for ten days in a warm place, frequently shaking. Dose, 1 to 3 drams.

Female Regulator.

(X. Y. Z.) We cannot give the formula for the proprietary preparation. However, most preparations of this character are constructed upon the type of the compound elixir of cramp bark of the National Formulary. Other formulas which have been suggested are the following, the first one being taken from the Era Formulary:

(1) Black haw bark	12 ounces
High cranberry bark	8 ounces
Blue cohosh	3 ounces
Life root plant	3 ounces
Sugar	4 ounces
Alcohol	32 ounces

Water, sufficient to make 1 gallon. Make a tincture of the drugs by percolating first with the alcohol mixed with an equal quantity of water, then with water until 1 gallon is obtained. In this dissolve the sugar and filter.

(2) Cramp bark	4 ounces
Partridge berry	4 ounces
Poplar bark	2 ounces
Unicorn root	2 ounces
Cassia	2 ounces
Beth root	1½ ounces
Sugar	24 ounces
Alcohol	16 ounces

Water, a sufficiency.

Reduce the crude drugs to a coarse powder; cover with boiling water, allow to stand until cold, and then percolate with water until 5 pints of liquid have been obtained. To the percolate add the sugar, bring to a boil; remove from the fire and strain. When cold, add the alcohol.

To Cement Cloth or Leather to Iron Pulleys.

(J. G.) Cloth may be cemented to iron pulleys by first giving them a coat of best white lead paint; this being dried hard, coat with best Russian glue, dissolved in water containing a little vinegar or acetic acid.

To cement leather to metal, Sieburger recommends the following: Digest 1 part crushed nutgalls with 8 parts distilled water for six hours, and strain; macerate the glue with its own weight of water for twenty-four hours, and dissolve; spread the warm infusion of the galls on the leather, and the glue on the roughened metallic surface; apply the prepared surfaces together, and dry gently; the leather then adheres so firmly to the metal that it cannot be removed without tearing.

The following method is a satisfactory one for covering pulleys with paper and, with a little modification, it may answer a similar purpose with canvas: Scratch the face of the pulley with a rough file thoroughly, so that there are no bright or smooth places. Then swab the surface with a solution of nitric acid, 1 part; water, 4 parts (for 15 minutes); then wash with boiling hot water. Having prepared a pot of the best tough glue, stir into the glue half an ounce of a solution of strong tannic acid, oak bark, or gallnuts, as convenient to obtain, to a quart of thick glue; stir quickly while hot and apply to the paper or pulley as convenient; draw the paper as tightly as possible to the pulley, overlapping as many folds as may be required. By a little management and moistening of the paper, it will bind very hard on the pulley when dry, and will not come off or get loose until it is worn out. Use strong hardware wrapping paper.

Problem in Alligation.

(Clerk) asks for a solution of the following problem: An apothecary has two kinds of opium, one containing 13.5 per cent., the other 16 per cent. of morphine, respectively. He desires to make 8 troy ounces of a mixture containing 14 per cent. of morphine. How much of the weaker kind must he use?

Answer.—6.4 troy ounces or 3,072 grains, of 13.5 per cent.; 1.6 troy ounces, or 768 grains, of 16 per cent.

The above problem is solved by alligation, and it may be explained as follows: The gain and loss of the percentage strength of the two quantities of opium used as compared with the mean percentage must balance. Hence, we compare a percentage less than the mean with one greater than it, or 13.5 per cent. with 16 per cent. On every part of 13.5 per cent. opium employed to make the 14 per cent. mixture there is a gain of 0.5 per cent.; on every part of the 16 per cent. opium used in the 14 per cent. mixture there is a loss of 2 per cent. of opium. As the gain and loss on equal parts of each are to each other as 0.5 to 2, we must take parts that are to each other as 0.5 to 2, or (reducing the numbers to integral quantities), as 1 is to 4. Using the proportions obtained to make an 8-ounce mixture, we have found that for every part of 16 per cent. of opium employed there must be taken 4 parts of 13.5 per cent. opium. Then 8 ounces must be 1 + 4 parts or 5 parts. If 8 ounces be 5 parts, then 1 part will be 1-5 of 8 ounces, or 1.6 ounces, the amount of 16 per cent. opium to be employed. Four parts will equal 4-5 of 8, or 6.4 ounces, the amount of the 13.5 per cent. opium to be employed. The results are easily reduced to grains, remembering that a troy ounce contains 480 grains.

Kidney Remedy.

(J. K.)

(1) Liverwort	4 ounces
Jamaica dogwood	1 ounce
Ergot	2 ounces
Couch grass	4 ounces
Wintergreen	2 ounces
Potassium nitrate	1 ounce
Alcohol	2 pints
Glycerine	12 fl. ounces

Water, enough to make 1 gallon.

Grind the drugs to No. 20 or 30 powder, percolate with all the glycerine and alcohol mixed with 2 quarts of water. When that has all passed, add enough hot water to make 1 gallon, and in which dissolve the potassinm nitrate.

(2) Liverwort	16	ounces
Dandelion root	8	ounces
Digitalis leaves	1	ounce
Hydrangea	4	ounces
Wintergreen	2	ounces
Potassium nitrate	3	ounces
Sugar	12	ounces
Alcohol	1½	pints
Menthol	5	grains
Water, sufficient to make	1	gallon

Grind the herbs, etc., to a coarse powder, and, having mixed the alcohol with 4 pints of water, moisten the powder with 2 pints of the mixture and macerate in a covered vessel for 24 hours. Then percolate until 7½ pints of the mixture have passed, in which dissolve the potassium nitrate and the sugar. The mixture may also be made from the fluid extracts of the drugs. The formula is as follows:

Fluid extract liverwort	16 fl. ounces
Fluid extract dandelion	8 fl. ounces
Fluid extract hydrangea	4 fl. ounces
Fluid extract digitalis	1 fl. ounce
Essence of wintergreen	1 fl. dram
Potassium nitrate	3 ounces
Sugar	12 ounces
Alcohol	10 fl. ounces
Menthol	5 grains
Water	5 pints

Mix the fluid extracts, alcohol, and water, add the essence of wintergreen and menthol; dissolve the sugar and potassium nitrate in the liquid, and filter.

Liver Remedy.

(R. B. H.) wants a palatable preparation made from the following formula:

Socotrine aloes	3 ounces
Peruvian bark	1 ounce
Black root	2 ounces
Rhubarb	1 ounce
Castile soap	½ ounce
Vinegar	16 ounces
Rectified spirit	7 ounces
Fluid extract licorice	2 ounces

Macerate 48 hours, strain and add 3 pounds of sugar. Dose, 1 dram.

This formula may be a very effective "liver remedy," but the resulting preparation would hardly become popular. Aloes is extremely disagreeable to many people, and its taste cannot be so completely disguised as to be acceptable to the average patient. Then, again, the wisdom of using soap in this mixture is not apparent, as it is decomposed by the vinegar. It should be omitted. Glycyrrhizin of the licorice is also precipitated by the vinegar.

Omitting the aloes and maintaining so far as possible the hepatic properties of the preparation as above indicated, we submit the following:

Fluid extract senna	2 ounces
Fluid extract cinchona	1 ounce
Fluid extract leptandra (black root)	1 ounce
Fluid extract rhubarb	2 ounces
Fluid extract serpentaria	1 ounce
Compound tincture of cardamom	½ ounce
Tincture ginger	½ ounce
Compound elixir taraxacum	4 ounces
Elixir glycyrrhiza, enough to make	1 pint

Of course, if desired, a fluid extract may be made directly from the crude drugs by percolation, using vinegar (dilute acetic acid) as the menstruum. In such a case the correctives and flavoring should be modified. A small quantity of mandrake might be substituted for rhubarb to advantage. By some authorities it is highly recommended in the treatment of torpor of the liver.

Liquid Fire Extinguisher.

(H. N. J.) Here are several formulas:

1. Make the following solutions: (1) Ammonium chloride, 200 parts; water, 20,000 parts. (2) Alum calcined and pulverized, 350 parts; water, 10,000 parts. (3) Ammonium sulphate, in powder, 3,000 parts; water, 500 parts. (4) Sodium chloride, 2,600 parts; water, 40,000 parts. (5) Sodium carbonate, 350 parts; water, 5,000 parts. (6) Liquid water-glass, 4,500 parts. Mix the solutions in the order named, and to the mixture add 20,000 parts of water.

2. Crude calcium chloride, 20 parts; salt, 5 parts, dissolved in water 75 parts. Keep at hand and apply with a hand pump.

3. Solution for hand grenades: Fill thin, spherical bottles of blue glass with a solution of calcium chloride, sal ammoniac or borax.

4. A good fire extinguisher that may be conveniently kept in ordinary one-headed barrels around buildings is prepared as follows: Sixty pounds salt, 30 pounds alum and 10 pounds sal-soda are dissolved in 13 gallons of water. This preparation acts by generating carbonic acid gas and by forming a non-fusible crust over the burning timbers as soon as it is thrown into the fire. In preparing the solution all materials used should be pulverized, and the water should not be above lukewarm. By heating the mixture to hasten the solution a considerable part of its fire-extinguishing properties would be lost. Sulphate of ammonia is also an excellent fire extinguisher, because it will melt at a low degree of heat and produce a crust over the burning materials. At higher temperatures it will be decomposed and give off vapors of superior fire-extinguishing properties. It is advisable to also have handy any substance that may be used to choke the fire. A material far better adapted than water to smother an incipient fire is ordinary sand. For instance, if oily waste or other material saturated with oil should catch fire a few handfuls of sand will do more to extinguish the fire than several pails full of water. Another advantage of sand is that it will do no damage itself like water to materials it is thrown upon. It is necessary to often change the water kept in barrels for fire extinguishing. This is avoided by using sand instead.

5. The Techno-Chemical Receipt Book gives the following formula for "cartridges" for extinguishing fire: Make the shells of parchment paper or sheet lead and fill them with 4 parts of a salt obtained by mixing 343 parts of sulphate of aluminum and 142 parts of sodium sulphate with 432 parts of water; and 1 part of sodium sulphide, separated from the 4 parts of the salt by a disk of parchment paper. The cartridge is broken and its entire contents are poured into the water to be used for extinguishing the fire.

Medicated Gauzes.

BORIC ACID GAUZE.—Boric acid, 5 gm.; boiling water, glycerin, 60 gm.; sterilized gauze, 2 gm (1 meter).

BORATED COTTON.—Boric acid, 12.5 gm.; alcohol, 200 gm.; glycerin, 10 gm.; absorbent cotton, 250 gm.

CARBOLATED GAUZE (10 per cent).—Carbolic acid, 3 gm.; alcohol, 40 gm.; glycerin, 1 gm.; sterilized gauze, 1 meter.

CARBOLATED COTTON (5 per cent.).—Carbolic acid, 12.5 gm.; alcohol, 100 gm.; absorbent cotton, 250 gm.

DERMATOL GAUZE (10 per cent.).—Dermatol, 3 gm.; alcohol, 75 gm.; glycerin, 2 gm.; sterilized gauze, 1 meter.

FERRIC CHLORIDE COTTON.—Ferric chloride solution, 125 gm.; alcohol, 200 gm.; absorbent cotton, 250 gm.

IODOFORM GAUZE (10 per cent.).—Sodium hyposulphite, 0.2 gm.; glycerin, 6 gm.; iodoform, 3 gm.; alcohol, 60 gm.; ether, 30 gm.; sterilized gauze, 1 meter.

IODOFORM GAUZE (20 per cent.).—Same as above, with 6 gm. of iodoform.

SALICYLATED GAUZE (10 per cent.)—Salicylic acid, 3 gm.; alcohol, 60 gm.; glycerin, 2 gm.; sterilized gauze, 1 meter.

SALICYLATED COTTON (4 and 10 per cent.).—Salicylic acid, 10 or 25 gm.; alcohol, 85 gm.; glycerin, 5 gm.; cotton, 250 gm.

SUBLIMATE GAUZE.—Sublimate, 0.12 gm.; alcohol, 50 gm.; glycerin, 1 gm.; sterilized gauze, 1 meter.

SUBLIMATED COTTON.—Sublimate, 0.6 gm.; alcohol, 50 gm.; absorbent cotton, 250 gm.

In place of absorbent cotton most physicians prefer charpie wool.

NEWS OF THE WEEK.

LATEST PHENACETINE CASES.

Edward N. Dickerson, of this city, has begun a civil suit in the United States Circuit Court against H. Gill for selling phenacetine on which no royalty had been paid to him. Mr. Dickerson owns the patent rights for this drug in this country, and Schieffelin & Co. are his only authorized distributing agents. It is said that a large amount of phenacetine is constantly being brought into the country from Canada and elsewhere, and is being sold quietly to retail druggists. Gill is the latest person of a long series to be thus accused. He is a salesman representing a Chambers street manufacturer of suspensory bandages. He carried phenacetine (Riedel), sulphonal (Bayer) and trional as side lines. He sold the phenacetine for 40 cents an ounce and made money on it. It is possible, but not likely, that Gill may make a fight to test the constitutionality of Dickerson's rights. There are plenty of retail druggists who would like to see the question settled judicially.

There seems to be little doubt that Gill actually did sell the goods as alleged. He practically admitted as much when he called on Anthony Gref, Mr. Dickerson's attorney, last week and asked to have the prosecution dropped on condition that he discontinue the business. Mr. Gref is reported to have told him he would let up on him on condition that he reveal the source of his supply and a complete list of his customers in the retail trade. These customers are mainly in New York City and Brooklyn. Mr. Gill replied that the man who sold him the drugs was unknown to him and he had forgotten the names of his customers.

The case was to have come to trial the 20th, but through some misunderstanding judgment against Gill was taken by default before that date. Mr. Gref agreed to ask for a reopening of the case and to allow another month's time for preparing the defense. The lawyer for the defendant is Thomas Gilleran, of 51 Chambers street, and when he was asked for further information in the case he sent the reporter of this paper to P. Diamond, a retail druggist, at 26 Rivingston street, who is studying law. Mr. Diamond was somewhat mysterious about the identity of Mr. Gill and refused to make any definite statement regarding the matter just at this time. Anthony Gref, when seen, exhibited the drugs which Gill was alleged to have peddled.

"What we are after is not Gill," said Mr. Gref, "but the people who sold him the goods and the people who purchased them from him. We make it a rule when we catch an agent to force him to show his books. He has to do it on the witness stand, you know. Then we institute proceedings against everybody who has bought or sold the phenacetine. We have secured injunctions restraining upwards of ninety firms from selling any more phenacetine except that put up in Schieffelin's packages, and in most of these cases we have also secured an order requiring the druggist to account to us for the price of the phenacetine and also for all his profits on the sale of it."

Mr. Gref showed certified copies of the injunctions mentioned which were secured against the following firms:

New York.—Louis Spingarn, Charles A. Aronstamm, John J. Munsell and Sidney Richard, John R. Caswell and William M. Massey, The G. F. Harvey Company, George F. Harvey, Alfred H. Williams, William H. Morrison, Charles C. Herrick and Jesse M. Adams, R. Vandenhenden and Reinhard A. Eschmann, William Falkiner, John H. Chapman, Bruno Reinhart, Isaiah Lewin, Joseph P. Smythe.

Massachusetts.—Sarah Silverstone, Charles E. Eames, Patrick Morris, William A. White, William B. Hunt and George M. Robbins, Clarence M. Rogers, S. A. D. Sheppard and Henry Thatcher, Charles A. Dailey, Henry C. Bispham, Everett G. Priest, Albert P. Fairbanks, Thomas R. Grimes, Moses D. Fisher and Nellie

THE PHARMACEUTICAL ERA

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Refilling Prescriptions.

A recent decision of the Supreme Court in Ohio is of great importance to druggists in that State. Its immediate bearing is upon the liquor question and the administration of the Dow law, but it involves the question of refilling prescriptions. A liquor dealer sold a customer a pint of whisky on a physician's prescription, and the attorney for the defense moved the discharge of the prisoner because the evidence was insufficient in law to authorize a conviction, inasmuch as the liquor had been sold on the prescription of a physician. The motion was overruled by the court. A motion was then made by the defense for a new trial, which was also overruled by the court. A bill of exceptions was then taken, and the case appealed to the Common Pleas Court.

The Common Pleas Court affirmed the judgment of the Mayor's Court, and the case was then appealed to the Circuit Court. This court reversed the decision of the Common Pleas Court and discharged the defendant. The City Solicitor of the village then prosecuted error to the Supreme Court of Ohio, which court affirmed the judgment of the Circuit, and ordered the Common Pleas Court to carry its judgment of reversal.

It will be seen that the sole question made and argued in this case was the right to sell liquor upon prescription by a liquor dealer, who was not a druggist, but, in addition, virtually deciding that any man who procures a prescription can present it and retain it for future use, and after some time can use it again and again. While the prescription may be originally intended to be used but once, no conviction can be had when it is shown that the sale of liquor was made on the presentation of the prescription, and the fact is fully established that anybody can sell on prescription as well as a druggist.

We do not care to argue the question whether, in Ohio, a man not a druggist can sell liquor on prescription, or whether it were intended by the Legislature that intoxicating liquors sold on prescription should be sold by druggists only. The point of importance is that the refilling of prescriptions seems to be tacitly legalized by the court, to say nothing of the fact that a certain class of physicians in Ohio will doubtless now be kept quite busy writing prescriptions for liquor to be repeated as often as desired.

A correspondent wishes our views on this case and particularly the prescription refilling part of it. We have repeatedly protested against prescription refilling, which has naught to commend but all to condemn it. On this, we hold exactly as our correspondent's own attorney does, whose opinion is thus stated:

> "A prescription is presented, accepted, filled, and with the intoxicating liquor (or any drug or medicine.—Ed. Era.), handed back to the purchaser. He holds it until he wants more of the liquor, presents it to some druggist, it is again filled, handed back, and thus continues ad infinitum. Are the druggists, other than the first, protected? Well, now, let common sense come in and take charge of things. What is that prescription after it has once been used but a fraud? It required in the first place the signature of a reputable physician in active practice to make it of any value whatever, and that physician, when he put his name to it, intended it for a certain

> purpose and no other; it has fulfilled that purpose, and now it is being used for something that was never contemplated by the physician who gave it force and power in the first place. If the prescription is of as much effect and is as much entitled to be sustained in the third use as it was in the first, then where is the virtue in having any prescription? A prescription is an order from the physician, and the order is based on information he has and that he, because of his advantage in special learning, can have, that the person to whom he issues the order requires the article. There is nothing of that kind in a prescription being used the second or third time.
>
> "Now, it is our opinion that if the druggist is absolutely innocent of any knowledge of any of the above, he cannot be held if he filled that prescription, although it may be the first, second, fourth or dozenth time; *but he would better be able to take the stand if necessary and swear that he believed he was filling it for the first time.* (Italics ours.—Ed.). We advise you when you fill a prescription to retain the paper; it is the only protection you have; if that was done by all druggists the trouble in question would not occur."

Sound, common sense this, the whole thing in a nutshell. It should be placed to heart by every druggist. Prescription refilling has had more to do in creating the feeling of discord existing between druggists and doctors than any other one agency. It is morally and professionally wrong, and doctors have every reason to protest against it. There are laws now in some States which forbid the refilling of prescriptions for morphine, cocaine, etc., but we would like to see this prohibition extended to all prescriptions of whatsoever character. We realize what a delicate question this is to discuss, that the evil has so grown and become so familiar that it is hardly looked upon as an evil by many druggists. But when we get right down to first principles, what else is it?

What a great thing for druggists and doctors if the ownership-of-the-prescription and the prescription-refilling questions could be definitely settled by law. What valid arguments can be advanced in support of the present state of affairs?

Registering the Formulas of Proprietary Preparations.

Much has been said of late years concerning the desirability of publishing on patent medicine labels the formulas for the contents of the packages or registering such formulas with State authorities duly constituted by law. Attempts to secure this result have been made in various States from time to time, but nothing definite has been effected. The presumption is warranted that many of these attempts have been "strikes," clubs to make the manufacturers contribute liberally to defeat inimical legislation. The latest effort is that now being made in Kansas, that State's Legislature being asked to pass a bill to prohibit the sale of patent medicines, drugs or nostrums until the formula is presented to and favorably passed upon by the State Board of Health, while a heavy license is fixed on all drug stores handling proprietary medicines.

While we have always maintained that the publication of patent medicine formulas under proper restrictions would be for the best interests of every one concerned, we can foresee little of good to result from the enactment of such a law as that prayed for in Kansas. The ordinary State Board of Health is not a body likely to be unprejudiced in matters of this sort, and to place the responsibility for the valuation of a remedy upon it would be a dangerous experiment. State legislation on this matter is not to be advised; there would be entirely too much variance between the several State enactments, which variance would work undeserved hardship and lead to evasions and abuses. But national legislation, of the right kind, we firmly believe is desirable, and would be acceptable to even the patent medicine men themselves, those at least who produce meritorious articles.

Why not disclose these formulas? It is often said that secrecy is the only protection enjoyed by the proprietary medicine. Common law, the trademark and copyright regulations are more protection than all the secrecy which can be maintained. For there is no real secrecy in matters of this sort. The composition of a medicine can be so closely ascertained that imitation becomes easy, and what is the protection from secrecy then? The proprietor then has remedy only in the common law. The ones who would really suffer from the publication of these formulas, the ones always found arrayed against threatened legislation in this direction, are the manufacturers of useless, false, fake articles, of lying pretensions, of no inherent virtues. These of course find secrecy their only support.

The honest manufacturer who tries to make a good article, who puts into it what he says he does, who exploits it on its merits, has nothing to fear. Not only would publication show his claims and his preparation to be true, but he would be relieved from the illegitimate competition from fakes and frauds which he now encounters.

We never could understand why there are such barefaced frauds as do exist among proprietary medicines. It is just as easy, costs no more, is far better policy and much safer to make a good preparation rather than a fake. Still the fakes are produced and flourish. They should receive no consideration from the law, however, but should be wiped out without compunction. No surer way to do this than by enactments of the kind proposed, which will protect the good and unmask the illegitimate. Prominent manufacturers have expressed themselves in favor of legislation requiring that all formulas of proprietary medicines be printed on the labels. What they want, however, is the right sort of a law, and this is a question which calls for most careful consideration and discussion. It must be national in character, and not place in the hands of a few chemists or doctors the power to pass judgment on the merits of a remedy. This can be safely left to the people. But there should be heavy penalties for false formulas. This being done, the public will decide, and very quickly, too, between the good and bad medicines. Competitors will see to it that the claims for any article are lived up to, and there would be graphic demonstration of the survival of the fittest. The people don't want fake medicines. They buy them because they do not know they are fakes. Let them know what they are buying, and merit will become the test.

Success in Sight.

The report of the work thus far accomplished by the Joint Congressional Committee on Free Alcohol for Use in the Arts has been issued. There are only a very few copies printed for the use of the committeee. It contains the full report of the hearings given by the committee in New York and Washington. The report of the commissioner appointed to go to Europe to see how alcohol regulations are enforced there is issued in a supplemental volume, of which at least 5,000 copies will be issued from the Government press. As this report is the strongest kind of a plea for free alcohol, the fact of its extensive circulation may be taken as a proof both that free alcohol is popular and that the attitude of the authorities is changing toward the question.

Thus all indications point to the early attainment of free alcohol. Congress itself, if reports may be believed, is in favor of the concession, and judging from the committee's report, the opposition to the free alcohol proposition has been meager. All classes of industries have presented their views forcibly, and as these opinions are in overwhelming majority in favor of it, the Government authorities have at last become impressed with the fact that the people are demanding relief from an unjust burden long borne uncomplainingly.

The committee recently secured a new lease of life in order to finish the investigation and make such recommendations as the evidence justified. While it would be manifestly unfair to the committee to attribute to them a conclusion already reached and a tentative bill already drawn up, as was done in the Oil, Paint and Drug Reporter of Feb. 8, it is nevertheless true that outside parties have been submitting to the committee drafts of bills and sections of bills favoring the establishment of a rebate for manufacturers who use alcohol. And it is not too much and not unsafe to predict that some such bill will ultimately be drawn up and presented as the mature recommendation of the committee. Nothing can, however, be accomplished before the next Congress meets.

AMYLO-IODOFORM.—A compound of iodine, starch and formaldehyde, of blue-black color.

OZALIN.—A mixture of sulphates of calcium, magnesium and iron with caustic lime and magnesia, used as disinfectant.

OMAL.—A trichlorphenol which is recommended as inhalant in treatment of inflammatory conditions of the air passages.

PIPERIDIN.—Since this compound forms more soluble salts with the urates, it serves a better purpose than piperazine in treatment of gout and rheumatism.

DEXTROFORM.—A preparation of iodine, formaldehyde and dextrin analogous to amyloform. It is soluble in water and can be used both externally and internally.

LACTOPEPTIN.—A mixture of 120 p. of milk sugar, 24 p. of pepsin, 18 p. of pancreatin, 1½ p. of diastase, 2 of hydrochloric acid and 2 p. of lactic acid. (Phar. Centh.)

EUCALYPTEOL (not Eucalyptol).—A hydrochloride of eucalypten prepared from the ethereal oil of eucalyptus. It is non-toxic, and is recommended as a substitute for eucalyptol in doses of 1.5 to 2 gm.

METHYLENE BLUE has been recommended in nervous headache and neurasthenia in doses of 0.1 gm., mixed with powdered nutmeg. Usually 4 doses in one day are sufficient to afford entire relief.

CHRYSOTOXIN.—One of the four principles isolated by C. Jacoby from ergot, namely chryso-secolin and sphacelo-toxin. This principle is said to be very stable and is recommended in form of a sodium salt for hypodermic use.

DICODEYL—MENTHAN-HYDROCHLORID.—The hydrochlorid of a condensations product of two molecules of codeine and one molecule of formaldehyde. It form a crystalline salt soluble in alcohol and water, and melts at 140° C.

PIPERIDIN GUAIACOLATE.—Obtained by action of piperidin on guaiacol in benzol solution, it forms prismatic needles, soluble 3½ parts in 100 of water. The salt is decomposed by mineral acids; it is given in doses of 0.2 to 2 gm. three times daily in treatment of tuberculosis.

GLUTOID CAPSULES.—Apothecary Hausmann, of St. Gallen, by hardening gelatin capsules with formaldehyde, has rendered them impervious to the action of the acid juices of the stomach, but upon contact with the alkaline secretions of the intestines this gelatin coat is readily dissolved. This offers a ready substitute for keratin or salol coating.—(Phar. Centh., 97, p. 24; '96. 483.)

John Carnrick.

John Carnrick, of Reed & Carnrick, New York, has done some very meritorious work in the realm of pharmaceutical chemistry. A native of Sand Lake, Rensselaer County, New York, he spent his boyhood in Troy and came to New York at the age of 17. After teaching school for a while he took a course in medicine, but instead of graduating he opened a drug store in Jersey City, and commenced the study of pharmacy and chemistry with a view to improving the palatable qualities of medicines. Thus John Carnrick may be said to be one of the pioneers in the field of what is known as elegant pharmacy.

The original drug store was operated by Mr. Carnrick under the name of Gardner & Carnrick. This was afterward changed to Carnrick & Andrus, and subsequently to Reed & Carnrick, a name now famous all over the world. Through all the changes of name it was Mr. Carnrick's genius as a chemist that made the success of the house possible. The preparations which he invented are used to-day by the medical profession in every civilized country on the globe. He has always in the introduction of his preparations to the medical profession given to them every detail of manufacture and invited them to his laboratories to examine every process and manipulation, and has always insisted that their introduction should be in the hands of the medical profession. Mr. Carnrick claims the honor of having introduced elixirs as a class of pharmaceutical products over thirty years ago. Among a few of the principal preparations he introduced are Lactopeptine, Maltine, Peptonoids, Peptenzyme, Protonuclein and Soluble Food.

One feature of Mr. Carnrick's business method has been the organization of several companies to carry on the sale of his various discoveries. Among these are the New York Pharmacal Association, the Maltine Manufacturing Company, and the Arlington Chemical Company. The preparations manufactured by these companies were popularized by Reed & Carnrick. The reason for the success of Reed & Carnrick's preparations is probably that Mr. Carnrick makes it a rule not to put upon the market a preparation of his invention unless it fills a want and is in his belief actually superior to anything of the sort previously discovered. Large fortunes have been made from his discoveries, one man having made from the manufacture of one of these preparations something like $2,000,000, it is said. Mr. Carnrick, though a wealthy man, has not reaped so largely as those to whom he has sold. He lives comfortably in a beautiful home on Park avenue with his family, to whom he is devoted. His place of business is unpretentious. It is located at 428 West Broadway, New York.

Correspondence.

We are pleased to publish here communications from our readers on topics of interest to the drug trade. Writers are requested to express their views as briefly as possible. Each article must be signed by its writer, but his name will not be published if so requested.

Abolish the A. Ph. A. Commercial Section.

A. S. Parker, Detroit, Mich.—In my opinion the A. Ph. A. has failed to produce practical results in so far as concerns commercial pharmacy. Without attempting to criticise so earnest and efficient an organization as the A. Ph. A., I only desire to state what in my opinion is the cause of failure. By strict adherence to "the one idea" only, whether it be science or commercial interests, can the best results be obtained. The N. W. D. A. is for business first, last and all of the time—no division of interests. I believe that the best interests of the pharmacist demand that the A. Ph. A. should confine its efforts to the development and advancement of scientific pharmacy, where it has achieved such marked success, and in addition to this there should be formed an association of earnest men with but a single aim, the protection and betterment of commercial pharmacy. The changed conditions of business demand that a united effort be made to save this branch of pharmacy from absolute ruin. Noble work has been performed along certain lines, but it has been demonstrated that new tactics must be adopted. Mutual manufacturing has received notice from some. That subject would properly come before such an association. I therefore believe that whether it be science or otherwise, the watchword should be "Unity of purpose."

* * *

Hy. P. Hynson, Baltimore.—I believe it is easy to sustain a contention which insists that the coupling of the really scientific with the purely commercial is detrimental to the advancement of science and to the enlargement of trade. Recorded facts strongly deny that advantages can accrue from such a union. If, indeed, the combination of the real and pure, as in this instance, results detrimentally we must expect something even more unsatisfactory will always be the outgrowth of combining any modification of these. Such conclusions are based upon principles thoroughly well established long, long before the American Pharmaceutical Association began its strikingly useful career, even before pharmacy as a profession had its birth. In the very face of opposing facts, then, and contrary to the leadings they would seem to offer through experiences so often repeated, the commercial section of the American Pharmaceutical Association must have been inaugurated. It has lived, however, and gone on living an aimless, useless life. Of course, I may not have heard of the good it has accomplished, but who has? Certainly it has killed much precious time, wasted valuable energy and worse than all else has brought sad disappointment which is always so discouraging, even blighting. This very trouble, this continual fault-finding, this busying itself about the business methods and individual conduct of its members, came quite near wrecking the Maryland State Pharmaceutical Association. It has only been since commercial questions were, by common consent, dropped that this association has shown any life or results. I am strongly of the opinion that the abolition of the Commercial Section of the American Pharmaceutical Association would make smooth the way to the attainment of much professional advancement through the influence and help of this heretofore heavily handicapped National Association.

* * *

R. N. Girling, New Orleans, La.—In answer to your query whether the Commercial Section of the A. Ph. A. should be discontinued on the ground of its failure to be useful to the interests of the pharmaceutical profession, I answer, most emphatically, yes; the sooner it is abolished the better it will be for the retail druggist, for the following reasons:

As the Commercial Section of the American Pharmaceutical Association, is at present constituted, it is certainly calculated to work harm to the retail druggists of the country at large, for their interests can never be in accord with those of the section, some of whose members are either manufacturers of proprietary articles, or have an interest therein sufficient to make them seek, by every means in their power to protect those of other manufacturers, who, numerically, form but a small percentage of the members of the American Pharmaceutical Association, or of the great army of pharmacists of the United States.

It must be apparent to any pharmacist who will take the trouble to think the matter over, that such a body of men can never aid his interests so long as their own, in protecting the manufacturers of patent medicines and proprietary articles, are menaced. The greed of gain and the desire to protect what they deem their rights would make them loth to take any action which might prove prejudicial to the interests of the manufacturers of such articles, which articles, they well know, even if they are disinclined to acknowledge it, form one of the principal evils the retail druggist has to contend with, having brought ruin or disaster to many of the fraternity.

As an illustration of the above remarks, it may not be amiss to recall an article on the patent medicine evil, which was published in the Pharmaceutical Era, indorsed by the Louisiana State Pharmaceutical Association and read at the Denver meeting of the A. Ph. A., suggesting some very, to the manufacturers, undesirable methods of dealing with the subject, among others advocating Federal legislation, with a view of placing certain restrictions on this class of preparations which would be the means of ultimately suppressing them. Had the suggestions contained in the article been acted on, immense benefit would have accrued to the retail druggist and to the general public, but at the same time almost incalculable injury would have been worked to the interests of the manufacturers of quack nostrums, who reap their rich harvests by catering to the gullibility of the public by means of specious advertisements. The "section" was no doubt fully aware of the truth of the above remarks, but, be this as it may, the fact remains that the article in question was tabooed and was not printed in the "proceedings" for that year, and in reply to a letter asking why the article had not been printed, the writer was informed that only those approved by the committee were published.

Of course, it would be unreasonable to expect the "Section" to allow any to be published which was calculated to work to the detriment of such of its honorable confreres as are interested in the manufacture or sale of proprietary articles, and if the retail druggist wishes to protect his interests in this regard, and finds it necessary to appoint committees for this purpose, he will do well to see to it that the men chosen are in no way interested in the sale or manufacture of such articles. Perhaps some druggists will say: "Oh! we are sick of the patent medicine question; it has been discussed in the journals and at our meetings until the subject has been worn threadbare and no good has resulted from it." Let those who are inclined to look at the matter in this light reflect on the old adage, "Gutta cavat lapidem," which is entirely applicable to the patent medicine evil, and by keeping up a constant agitation against this class of goods, they will ultimately succeed in securing such legislation as will relegate them to their proper sphere. Some good has already been secured by agitation, as some States have enacted laws, restricting, more or less, the power for harm of the quack nostrum.

It will not do to rest until Congress passes such laws as will be for the benefit of the whole country in protecting its citizens from a species of fraud which has been so long tolerated, and its perpetrators have accumulated such enormous profits that they can almost buy the public press and can employ the highest legal talent in overcoming opposition to their nefarious traffic. Let the retail pharmacist continue the agitation and present papers for reading and discussion at the next meeting of the local pharmaceutical association and at the next meeting of the A. Ph. A., and something good will ultimately come of such action on their part. Let them, however, look upon the manufacturers as their worst enemies, and if possible secure the abolition of the Commercial Section of the A. Ph. A. as now constituted.

Doctors Want to be Druggists.

A number of physicians of Benton Harbor, Mich., have sent to the Legislature at Lansing a signed petition requesting that the pharmacy law be so amended "that a graduate in medicine from the University of Michigan, or from any medical college having a medical and laboratory course of instruction equivalent to that given in the university of this State, be permitted to be registered without examination." It is alleged in this appeal that "after the act became a law all physicians who did not register as pharmacists at the time the act went into effect, and were therefore obliged to employ a registered clerk, soon discovered that the profits from both their practice and the sale of drugs would not sustain their families and keep a registered pharmacist also.

"Not only that, but it was likewise made evident, and has been thoroughly demonstrated during the ten years the law has been in effect, that every registered pharmacist was indirectly constituted, by the act, a practitioner of medicine, and came in direct competition with every practicing physician. * * * Thus the honest physician in this State, with legislation against him, and with no medical law whatever in his favor, is placed between the advertising quack on the one hand and the counter prescriber, or registered pharmacist, on the other."

Commenting upon this petition a correspondent sends the following letter:

Benton Harbor, Mich., Feb. 15.

To the Editor:

The worthy doctors whose signatures are attached to the above item, seem to think it an imposition to ask them to go before the board and pass an examination.

After the time spent, the vast amount of labor, and the money expended by the pharmacist to make himself what he is, these worthy gentlemen appear to think that because they study to become doctors, they should be declared by law registered pharmacists.

We would ask them if they are not afraid to try the examination? It looks as if that was why they desired the amendment to the pharmacy law.

On the other hand we, the registered pharmacists of the State of Michigan, are protected by said law, and in conjunction with the State board try to uphold it.

We, graduates of Ann Arbor and other colleges, go cheerfully before the State Board, after studying two or three years, as the case may be, to become worthy of the confidence placed in us as pharmacists, while the doctors—poor, abused mortals—should be declared pharmacists by law.

The worthy gentlemen appear to take pleasure in placing us on a level with the quacks of their own profession.

We would like to ask them who is better qualified to give a dose of medicine than the man who has taken the drug in its native clime, watched with interest its early growth, its gradual development into the drug of commerce, its various steps through commerce, and is versed in its nature, appearance, various preparations, and dose and action thereof. Who, we ask them, is better qualified to dispense it?

Does a course in medicine thus enter into all the details of each and every drug found in a drug store? We answer, not any more so than a course in pharmacy, and further, we venture to say that very often the pharmacist is better qualified to dispense than the doctor who prescribes.

Let us as pharmacists, proud of our profession, hold together and do all in our power to crush out any such an amendment ever being made to the pharmacy law. Our ranks are already full of inefficient clerks, without adding to the list the ever-grasping doctors, some of whom are altogether unworthy to be called pharmacists. Let them be satisfied with their own worthy profession, without asking the law to make them a present of ours.

F. B. MIX, Ph. G.

Easter Advertising.

Canton, Mo., Feb. 14, 1897.

To the Editor: I submit herewith a scheme for Easter advertising which, if not altogether new, may prove of interest to some of your numerous readers.

The article I advertised was White Rabbit Egg Dye, the same as advertised so prominently in your last issue. The same display will answer for any Easter dye, but more appropriate for the above mentioned.

I covered the bottom of the window with fresh green sod, and in one corner I placed a miniature log cabin, large enough to hold four or five rabbits. The cabin had an old-fashioned chimney, windows, and a door large enough to admit the rabbits. In the opposite corner of the window I made a nest and filled it with an assortment of colored eggs. A few small branches of trees, stuck here and there in the sod, relieved the bare effect of the bottom of the window. For a background I made a picket fence about 2½ feet high, using some old laths for pickets, which harmonized very nicely with the rustic foreground. This completed my stage settings.

Next, the actors, the "White Rabbit Family," consisting of one old white rabbit, the mother, and four young ones about three weeks old, all pure white. I had nothing to do but turn them loose in the window; they "done the rest."

For a week I had a continuous performance in that window, and crowds in front all the time. I kept the rabbits well supplied with grass, cabbage, etc., which they devoured eagerly, to the great delight of the crowds of children.

On front of window and on the fence we had strips advertising White Rabbit Dyes which come with the goods. Of course, we sold quite a quantity of dyes, but if we had not sold a package we would have been repaid many times for our trouble by making our store more attractive, and thereby increasing our general business. The rabbits, of course, may not be procured in some places, but in almost any large town or city a small want ad in a daily paper will find them.

HORACE B. LINN.

(Specially Contributed.)

RECOLLECTIONS OF AN OLD-TIME DRUG CLERK.*

By CHAS. D. DESHLER, New Brunswick, N. J.

When I entered upon my novitiate in the art and mystery of an apothecary, the business was in a semi-transition state, and had entirely divorced itself from the sale of dry goods and groceries, which had formed an important branch of the business in the last century and in the early part of the present century. I speak more particularly of the business as it was conducted in New Brunswick, N. J., where I began my novitiate on Sept 1, 1832. But I think that I am entirely safe in saying that the business as then conducted in New Brunswick was a favorable type of the business elsewhere in New Jersey, for New Brunswick was then one of the largest, as well as one of the oldest cities in the State, and several of its druggists were considerably in advance of any others in the State. A glance at the business as it was then conducted in New Brunswick, as I am now able to recall it, may afford an opportunity for a comparison of the equipment and methods of the druggists of New Jersey of half a century and more ago, and of those to-day, as also an opportunity for a view of some of the remedial agencies that were then poular, their modes of preparation, dispensing, etc.

Chas. D. Deshler.

Although, as I have said, the business had divorced itself from two of its illegitimate affinities, it still retained, and indeed had greatly enlarged, its relations with other affinities which were no less illegitimate than those which it had discarded, but still were not so absolutely incongruous as they with the art and calling of an apothecary. The population of the city was not sufficiently large to afford a very substantial patronage to the apothecary department proper. Certainly, it was not large or remunerative enough to satisfy the aspirations for wealth of those who were engaged in it. And, as the town was then, and for many years later continued to be, the chief market and source of supplies for the farmers and country dealers in the section extending from Rahway and Plainfield on the east, to Somerville, Clinton, Flemington and Easton on the north, and to Princeton, Trenton, Allentown and Freehold on the west and south, the New Brunswick druggists included in their stock, paints, oils, dye stuffs, varnishes, window glass, bakers', fullers', and hatters' articles, lime, sand, tar and ship chandlery, snuff, spices, liquors, etc. I observe, in passing, that liquors were only sold by druggists by the bottle or by the pint, quart or gallon. I never knew or heard of any having been sold by them to be drunk on the premises. Moreover, their sale was confined almost exclusively to wines and brandy. Whiskey, rum, and the like, were seldom, if ever, sold by them.

But, notwithstanding that these unrelated branches constituted by far the larger part of the stock and sales of the druggists of that day, it was the apothecary department which chiefly occupied their time and thoughts, and which gave their business the special distinction and consideration which it enjoyed in the popular estimation. For the apothecary was then popularly rated as a quasiprofessional, perhaps because the art and mystery of his calling demanded a longer training and a higher intelligence for its mastery than that of any other mercantile or mechanical pursuit, and, besides, involved a much greater degree of responsibility. Beside the ordinary merchant, the apothecary was comparatively learned. He knew something of Latin, and assumed to know much more of it than he really did; for it must be confessed that his familiarity with it seldom extended beyond the officinal names of his drugs, medicines, tinctures, herbs, etc. But this, small though it was, was considered a mark of distinction by the multitude, who regarded with unaffected admiration the learning displayed by the man or lad who glibly rolled off such long and thundering terms as "aqua picis liquidæ" for tar-water; "adeps suillus præparatus," or "axungia porcina" for common lard. "sulphus aluminæ et potassæ" for alum; "tinctura opii camphorata" for paregoric; "stannum" for tin; "amylum" for starch; "mel despumatum" for honey; "extractum glycyrrhiza" for licorice; "carbo ligni" for charcoal; "sinapis nigra" for common mustard; "serum bovinum" for common tallow; "triticum hybernum" for common wheat flour; "aqua pluvialis" for common rain water, etc.

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*Read before the New Brunswick Historical Club.

But this little pedantry aside, the druggist of that period was really possessed of more than average intelligence, and had acquired a large amount of more or less precise knowledge as to the origin, nature, uses, preparation, and dispensing of medicines. He was usually the first one—even before the physician—to whom the people had recourse in sudden emergencies, or on the access of most of the common ailments; and he prescribed and administered medicines with a free hand, and generally with prudence and success. He was expected to know how to treat promptly, burns, scalds, sprains, frost-bites and flesh wounds, cases of simple poisoning and attacks of diarrhœa, cholera morbus and cholera; and, generally, he did so as skillfully as any physician could do.

The druggist of that day was as ignorant of chemistry as a science as are the majority of the druggists of today. His chemical knowledge was a mere smattering. He knew the officinal names of the comparatively limited number of "chemicals" that were then embraced in the pharmacopœia, and was familiar with their medicinal properties, doses and uses. He knew which of them had a chemical affinity for, and which were incompatible with, some other; and also in what menstruum each was soluble, and in what vehicle it was best administered. He had some knowledge of tests and reagents, and could not only skillfully distinguish one chemical from another, but was a good judge of its quality, as well as of the qualities of medicines generally. There was no use in trying to palm off upon him for genuine, powdered opium, or ipecacuanha, or rhubarb, or aloes, which had been adulterated with powdered licorice root or some other comparatively cheap substance; or Egyptian for Turkey opium; or sophisticated for pure cream of tartar, powdered ginger, or arrow root; or roots and barks from which the properties had been partially extracted by infusion or otherwise, for those which had not been tampered with. He could detect the cheat on the instant by touch or sight, just as he could detect a bad bill or a counterfeit shilling; and the wholesale dealer who attempted to "turn an honest penny" in this way at his expense would quickly find out that he had "waked up the wrong customer." But with all this knowledge and a remarkable skill in manipulation, he knew nothing whatever of the elementary chemical constituents of the medicines which he handled, or of their nature and proportions, nor, generally, of purely chemical principles, processes, and operations.

The druggist of those days, I am inclined to believe, was far more completely the master of his business generally, in the line of the manufacture of medicines, than is the druggist of to-day, for the reason that numberless articles which are now bought by him ready-made were then home-made. The druggist of those days spread all his own plasters, and spread them rapidly and with skill and elegance. To spread a compound burgundy pitch plaster quickly and neatly was one of the first lessons of his novitiate. He prepared his own blue mass, his own syrups, perfumery, medicated waters, confections, conserves, cerates, ointments, plasters, liniments, tinctures and "preparations," technically so called. He made his own pills of all the standard kinds set forth in the Dispensatory, chief in demand among which were the compound cathartic, compound aloes, compound iron, compound colocynth, compound rhubarb, aloes and myrrh, asafœtida, quinine, guaiacum, opium, etc., as, also, his own powders of all kinds, with the exception of Peruvian bark, jalap, rhubarb, ipecacuanha, and a few others. He manufactured his own soda water and fruit syrups, his own soda and seidlitz powders, his own inks, sealing wax, copal, japan, and black varnishes, his own putty, boiled linseed oil, prepared fish oil for painting, etc., and he was an adept in mixing paints of all colors for retailing, and in preparing a multitude of other things which need not be now specified.

I have said that the druggist then made his own tinctures and powders. The former were prepared in the primitive way, by digestion, and not by the more perfect process of displacement which was introduced later. Such tinctures, as laudanum, paregoric, colchicum, rhubarb, and the simple and compound tinctures of bark and aloes, which were the kinds most largely in demand, were prepared in five gallon demijohns, each of which had a label tied around its neck like a white collar, on which the date of the original preparation was written and the number of days it must undergo digestion; and regularly thrice a day or oftener it was the duty of us junior clerks to agitate it briskly, so as to facilitate the process. Tinctures which were not in so great demand were made in gallon, half-gallon, or quart tincture bottles similarly labeled and subjected to a similar agitation.

The process of powdering was always a laborious, and sometimes a very trying, one, to the unfortunate whose fate it was to effectuate it. And when the substance was to be reduced to an impalpable powder, many distressing hours were the lot of the operator. Especially was this the case when the substance to be so reduced was canella bark, squills, scammony and, most intolerable of all, hellebore root and gum gamboge. Such sneezing as was provoked by the hellebore, and such sore eyes and noses—especially noses—as were caused by the gamboge, were, in the expressive vernacular of that day, " a caution!" The effect of each was simply intolerable, as any one who is curious on the subject may learn by experiment. The experience, I promise him, will make an indelible impression alike upon his olfactories and his memory.

The home-made syrups of that day were much richer, denser, and more limpid than are those we are now accustomed to see. They were invariably made of the best loaf sugar, assisted in the process of clarification by the whites of eggs or Russia isinglass. Lemon syrup was prepared from simple syrup by the addition of the requisite amount of a saturated solution of citric acid to give it the necessary acidity, and a few drops of concentrated essence of lemon to impart the proper flavor. All the fruit syrups—raspberry, strawberry, blackberry, pineapple, etc., were made direct from the fruit instead of by the aid of the factitious and unwholesome flavoring essences which are now too commonly employed.

My mention of burgundy pitch plasters in my list of home-made articles recalls an amusing incident in my very early experience. My entrance on the calling of a druggist was in the first "cholera year," 1832, in the midst of the panic created by that dread epidemic. Let me premise my relation of the incident by saying that this panic was hysterical, ungovernable and universal—shared in alike by all ages, from childhood to "tottering old." The odor of chloride of lime pervaded the entire atmosphere inside our city limits, and a bottle of Labarraque's Solution (solution of chlorinated soda) formed a part of the outfit of every household. The curbstones throughout the town were all white-washed diligently and repeatedly, and our gutters flowed with a semi-fluid paste of quick-lime and the chloride of lime. People shunned fruits and vegetables as if they were poison. Nearly every man, woman and child was provided with a charm or amulet in the form of a camphor-bag, which was suspended from the neck and worn next the skin just under the breast-bone, and generally one was also carried in the pocket, where it might be easily reached by the owner, to be held under his nose when feeling a passing qualm or when traversing some unsavory locality. Almost the entire population dosed themselves industriously from morning till night with oil of cajeput, spiced brandy, tinctures of ginger, camphor, cloves and cayenne pepper, and other stimulating preparations, and wore burgundy pitch plasters, ad libitum, on the breast or stomach, or both. The first salutations in the morning and the last at night were the cheerful ones, "Such and such an one was attacked with cholera," or "So-and-so and so-and-so died with it last night," or "There have been so many new cases and so many deaths to-day." The grand staples of conversation on the streets, at the market-house, in the cigar-shops, and at all the other headquarters of town gossip, were cramps, rice-water discharges, collapse, and sudden death, with which our citizens frightened one another till each fancied that he saw symptoms of the pestilence in some other, or felt them in his own bowels.

One Sunday morning, when the epidemic was at its worst and the panic at its height, I was left in charge of the store while my elders snatched a little needed relaxation from the long strain to which they had been subjected. I had become quite familiar with the common cholera remedies and the doses in which they should be administered, and had been specially coached for the occasion by the head clerk, who was an experienced pharmacist. Of course, I felt highly important over the trust that was reposed in me, and also felt several inches taller in consequence. As fortune would have it, my first customer was a gentleman whom I had known from my very early boyhood. He was a theological student, some 28 or 30 years old, and in after years a popular clergyman—a large, fine-looking, florid complexioned and robust man, usually full of life and overflowing with gayety and animal spirits. He now came rushing into the store, wearing a most dejected and woe-begone appearance. "Charley," he exclaimed, after looking around in vain for the head clerk, "Where is Boyer?" "Gone out, sir, for a little while to get some rest," I replied. "Great heavens!" he cried, "What shall I do? I'm going to have an attack of cholera!" I assured him that I could give him whatever was necessary, if he would only describe his symptoms; and I ran glibly over the names of various preparations suited to various cases. But he vowed he would have none of them. What he wanted—and he would have nothing else—was a burgundy-pitch plaster which should extend from just below his throat down to and below the pit of his stomach, and although we had an abundance of ready-made plasters on hand, which I showed him, none of them approached these large proportions.

Now, if there was one thing I could do better than another, it was to spread a plaster, since I had been sedulously drilled by Boyer in that specialty till I was an expert at it. So, I very confidently assured my friend that I could spread a plaster, the mixture for which was always ready, and had only to be melted, as well as Boyer or any one else. "Well, then," he said, "get about it as quick as lightning." I placed the plaster over an alcohol lamp, and while it was melting got out the sheep skin on which to spread it. My friend then traced on the skin the outline of a huge pear-shaped plaster, some sixteen to seventeen inches long from apex to base, and I speedily cut the skin according to his pattern, after which I spread it thickly with the plaster, in obedience to his repeated injunctions not to be afraid of putting on too much of it. He was a very hairy man—his breast and a considerable part of his abdomen being covered with a thick silken growth; and before coming to our store he had shaved this off, so that the plaster should have a chance to adhere to the skin properly. It was not long before I had the plaster in readiness; and, retiring with him to a back room, I clapped it on, and by the aid of a warm spatula made it adhere beautifully at every point. No sooner was it on, and its genial warmth perceptible than my mercurial friend regained all his wonted elasticity of spirits. His fears abated; his dejection vanished, he complimented me highly on my dexterity, buttoned himself up, humming a gay tune the while, which, I lament to say, was not a psalm tune, and left the store cheerfully slapping his breast and stomach, and declaring that he already felt like another man.

The sequel now remains to be related. A day or two afterward my friend again visited me, as anxious this time to get that "confounded plaster" off, as he had been on his former visit to get it on. Scratching and rubbing his breast and stomach like a madman, declared that he had not been able to sleep on account of the intolerable itching caused by the confounded plaster. He had tried again and again to get it off, but it was no use; it stuck closer than a brother, and on his last attempt to dislodge it his skin had given way, and now he was in torture. It seems that in the interval the hair which he had shaved off had begun to grow again, and had caused a degree of irritation, which, added to that which naturally resulted from the rubefacient properties of the plaster, had now become unbearable. Well, we took him again into the back room, where Boyer and I, by the aid of a pair of scissors and the application of heated spatulas, after an hour or two's hard work, and numberless groans and ejaculations, finally rid our friend and patient of his blanket-plaster, and put a cooling dressing on his inflamed bosom and abdomen. He had had a pretty lively experience, one which he remembered for many a day. But, he didn't get the cholera!

(To be continued.)

COAL TAR DYES AND DIGESTION.—The effect which coal-tar colors may exert upon digestive ferments has received attention at the hands of H. A. Weber (Jr. Am. Ch. Soc., Ph. Jr.), who has experimented upon pepsin and pancreatin with selected dyes in common use by confectioners and others. For the experiments on peptic digestion the color to be tested was added to the following mixture: Hydrochloric acid solution (0.2 per cent.), 100 cc.; pepsin, 0.020 gm.; blood fibrin preserved in alcohol, 1.0 gram. The fibrin was washed with water before use to remove alcohol, and excess of water removed by pressing between filter paper. The mixture was placed in a test-tube and heated on a water-bath at a temperature of 38° to 40° until the fibrin was as far as possible dissolved. Under these circumstances, oroline or acid yellow was found to exert a marked injurious effect upon peptic digestion, but no effect was produced by saffoline (acridine red), magenta, or methyl orange under similar conditions. The mixture used for the experiments on pancreatin was as follows: Water, 100 c. c., sodium bicarbonate, 1.5 gram; pancreatin, 0.3 gram; fibrin, 1.0 gram, and in this case the action of the ferment was unaffected by oroline yellow. On the other hand, saffoline, magenta, and methyl orange completely stopped the action of pancreatin in strong solutions and retarded it to a marked extent in weaker ones.

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LIST OF REACTIONS AND REAGENTS ACCORDING TO NAMES OF AUTHORS.

LEGER'S.—Reagent for Bismuth.—A solution of cinchonin nitrate with potassium iodide, which produces with bismuth salts a dark-red precipitate.

LEHMANN'S.—Test for Glucose.—The substance is dissolved in alcohol, alcoholic potassium hydrate added, followed by a solution of copper sulphate, then warmed. If glucose is present, red suboxide of copper precipitates.

LE NOBLE'S.—Test for Acetone in Urine.—On adding sodium nitroprusside and aqua ammonia to the urine containing acetone, a violet color is produced.

LEISMER'S.—Test for Glucose in Urine.—A mixture of 5 cc. of a 1 per cent. solution of safranin, 1 cc. of urine and 2 cc. of sodium hydrate solution are heated to boiling; if glucose is present a decoloration of the solution follows.

LENZ'S.—Test for Pilocarpin.—On triturating the alkaloid or its salt with 100 p. of calomel a gray to black coloration ensues, owing to the reduction of the calomel. According to Nagelvoort, the alkaloid is first prepared from the nitrate by the addition of ammonia and shaking with chloroform.

LEPAGE'S.—Reagent for Alkaloids.—See Marme's Test.

LETHEBY'S.—Aniline Test.—When heated with dilute sulphuric acid and manganese dioxide (50° C.), aniline gives a blue coloration.

LEWIN'S.—Test for Biliary Colors.—The urates, which separate on exposing the sample to cold, are filtered off, washed, dissolved in hot water and tested according to Gmelin.

LEWIN'S.—Baudouin's Test.

LEX'S—Phenol Test.—A solution of calcium hypochlorite (1 : 20) is added to an ammoniacal solution of phenol; a green coloration ensues, which turns blue on warming. Cotton modifies this by employing bromine water in place of the hypochlorite.

LIEBEN'S—Acetone Test.—To the solution (distillate from urine), a solution of iodized potassium iodide with a few drops of potassium hydrate is added. If acetone is present iodoform is formed. Alcohol gives this same reaction. (Compare Gunning's Test.)

LIEBERMANN'S—Test for Cholesterin.—A solution of a compound of cholesterin in acetic anhydride to which chloroform has been added is colored rose by concentrated sulphuric acid. The color quickly changes to blue and then green.

LIEBERMANN'S—Phenol Reaction.—On warming phenol with sulphuric acid, in which 5 per cent. of sodium nitrite has been dissolved, a blue color is produced. The addition of water causes a brown coloration.

LIEBERMANN'S.—Test for Diazo-and Nitroso-Compounds.—These bodies, when added to a mixture of phenol and sulphuric acid, produce intense colorations.

LIEBIG'S—Prussic Acid Test.—Hydrocyanic acid, to which a few drops of potassium hydrate solution and ammonium sulphydrate have been added, when evaporated and the residue rendered slightly acid (HCl), will give a blood red coloration upon the addition of ferric chloride.

LIEBIG'S—Quinine Test.—0.5 gram of quinine sulphate is shaken with 5 cc. of ether (0.728 sp. gr.) and 1cc. of ammonium hydrate (10 per cent.) in a well stoppered reagent glass; on standing, two clear layers should separate. Any turbidity indicates the presence of cinchonin, or other side alkaloids. Compare Kerner, Schäfer, de Vrij.

LIEBIG'S—Test for Cystin.—Cystin prepared from urine sediment on boiling with a solution of lead oxide in caustic soda causes a precipitation of lead sulphide.

LIFSCHUETZ'S—Cellulose Solvent.—A mixture of sulphuric and nitric acids.

LINDE'S—Test for Glycerin in Fluid Extracts.—

1. The sample is made slightly alkaline with a solution of sodium carbonate, then mixed with powdered borax on a watch-glass. This mixture gives a green tinged flame when mixed with alcohol and ignited.

2. Red litmus paper is saturated with a concentrated solution of borax, whereby it is turned blue. This is then moistened with the above (1) alkaline solution containing glycerin, when a reddening occurs more or less rapidly, according to the proportion of glycerin present. (Compare Hager's Glycerin Test.)

LINDO'S—Test for Alkaloids.—The alkaloid is dissolved in sulphuric acid and ferric chloride added. Color reactions are produced. (See Hager, Pharm. Praxis. III., 64.)

LINDO'S—Test for Nitrates and Nitrites.—Nitrates and nitrites give a violet coloration when added to a few drops of hydrochloric acid (15 per cent.), followed by a like quantity of a 10 per cent. solution of resorcin and 2 cc. of pure concentrated sulphuric acid.

LINDO'S—Test for Saccharine.—The saccharine is evaporated to dryness with concentrated nitric acid, to the residue a few drops of a solution of potassium hydrate in 50 per cent. alcohol are added, and on warming, blue, violet and red colorations are obtained.

LIPP'S—Test for Dextrine.—To a (cold) saturated solution of lead acetate, heated to 60° C., lead oxide is added until a solid mass is obtained, then after a time it is extracted with water and filtered. The resulting solution when boiled with a solution of dextrine gives a white precipitate.

LOEFFLER'S—Methylene Blue Solution.—This stain for tuberculosis bacilli consists of a mixture of 30 volumes of concentrated alcoholic solution of methylene blue and 100 volumes of potassium hydrate solution (1 : 10,000).

LIVACHE'S—Test for Fatty Oils.—This test consists in noting the increase of weight sustained when the oil is triturated with finely subdivided lead.

LOEWE'S—Glucose Test.—The reagent contains 16 grams of copper sulphate, 64 grams of water, 80 cc. sodium hydrate solution (1.34) and 6 to 8 grams of glycerin. Solutions of glucose or urine containing sugar give a red precipitate on heating with this reagent. For quantitative work the reagent should contain 15.621 grams of cupric hydrate (from 40 grams of crystallized copper sulphate), which is dissolved (in moist condition) in a mixture of 30 grams glycerin, 80 cc. of sodium hydrate solution (1.34) and 160 cc. of water. After solution has taken place water is added, to make up to 1,155 cc. Each 10 cc. of this solution corresponds to 0.05 gram glucose.

LOWENTHAL'S—Test for Glucose.—A solution of 60 grams of tartaric acid, 240 grams of sodium carbonate and 5 grams of crystallized ferric chloride in 500 cc. of hot water. Solutions containing glucose when boiled with this reagent give a brown precipitate.

LOOF'S—Morphine Test Solution.—Froehde's reagent in different degrees of concentration, whereby various color reactions are obtained. (See Apoth. Ztg., '95, 449.)

LUCHINI'S—Alkaloidal Reagent.—A solution of potassium bichromate in hot, concentrated sulphuric acid. Veratrin gives a yellow color with this reagent.

LUECKE'S—Test for Hippuric Acid.—Hippuric acid is boiled and evaporated to dryness with concentrated nitric acid. The residue on heating gives off the odor of nitrobenzol.

LUGOL'S SOLUTION—Test for Albumen.—This reagent consists of a solution of iodine in potassium iodide, acidified with acetic acid.

LUNGE'S—Test for Nitrous Acid.—This depends upon Gries's Test with sulphanilic acid and alpha-naphthylamine, in which the reagents are kept in solution with dilute acetic acid. Fluids containing nitrous acid give a red coloration with this reagent. Quantitatively, the reagent is applied in:

LUNGE AND LEVOFF'S—Test for Nitrous Acids.—The solution consists of 0.1 of alpha-naphthylamine dissolved in 100 cc. of water, 5 cc. of glacial acetic acid and 1 gram of sulphanilic acid, dissolved in 100 cc. of water. A standard nitrite solution is prepared by dissolving 0.0493 gram of sodium nitrite in 100 cc. of water. Of this solution, 10 cc. are taken and concentrated sulphuric acid is added to make up to 100 cc. Each 1 cc. of this solution contains 1-100 milligram of nitrite nitrogen. Into each of two cylinders 1 cc. of the reagent, 40 cc. of water and 5 grams of sodium acetate are placed; 1 cc. of the normal solution is added, and to the other, the solution to be tested. The color produced is compared with that produced by the standard.

LUNGE AND LEVOFF'S.—Test for Nitric in presence of Nitrous Acid.—This is applied colorimetrically, by means of a solution of 0.2 gram of brucine in 100 cc. of concentrated pure sulphuric acid. A normal solution is prepared by mixing 10 cc. of a solution of 0.0721 gram KNO_3 in 100 cc. of water, with concentrated sulphuric acid, sufficient to make 100 cc. One cubic centimeter of this normal solution, and 1cc. of the solution to be tested, are mixed with 1 cc. of brucine solution. Sulphuric acid is added to each to bring the volume up to 50 cc. They are then heated to 80° C., allowed to cool, and the yellow color compared. Of the above normal solution each 1 cc. is equivalent to 1-100 milligram of nitrate nitrogen.

LUSTGARTEN'S—Tests for Iodoform.—

1. On warming a little phenol with potassium hydrate solution and 1 to 2 drops of a solution of iodoform a slight reddish precipitate forms which dissolves in alcohol with a like color.

2. Resorcin 0.1 gram and a piece of sodium are dissolved in 5 cc. of alcohol, 5 drops of the green solution are mixed in a test tube with an ethereal solution of iodoform, and the ether evaporated cautiously. A cherry-red color is produced which is destroyed by acids and restored by alkalies.

LUSTGARTEN'S—Test for Naphthols.—See Wolff's Test.

LUX'S—Test for Fat-Oils in Mineral Oils.—Two test tubes, each containing a few cubic centimeters of the oil to be tested, are immersed in a paraffin bath heated to 210° C., for about fifteen minutes. Into one a few pieces of caustic soda, and into the other some pieces of metallic sodium, are placed. If the oil contains only 2 per cent. of a fatty oil, either one or the other sample will jellify.

LYON'S—Mixture for Extracting Strychnia.—This mixture consists of 3 volumes of ether mixed with one volume of a mixture of 88 cc. chloroform, 12 cc. alcohol and 2 cc. of aqua ammonia. It is used for the extraction of strychnin and brucin by agitation process.

MACLAGAN'S—Cocaine Test.—To 50 cc. of a 1-10 per cent. cocaine solution, 2 to 3 drops of aqua ammonia are added, the sides of the tube vigorously rubbed by a glass rod. The cocaine precipitates in crystalline form, while any amorphous alkaloid present will cause a milkiness.

MAISCH'S—Test for Curcuma.—See Howie's Test.

MANDELIN'S—Alkaloidal Reagent.—A solution of 1 gram of ammonium vanadate in 200 grams of sulphuric acid (concentrated). It gives various color reactions with alkaloids.

MANGINI'S—Alkaloidal Reagent.—Obtained by treating 3 parts of potassium iodide and 16 parts of bismuth iodide with 3 parts of hydrochloric acid. It gives brown precipitates with alkaloids. Compare Dragendorff's Reagent. It has the advantage over the latter in not becoming turbid with water.

MANN'S—Test for Water in Alcohol, Air, etc.—One part of molybdic acid and two parts of citric acid are triturated together, then fused and dissolved in water. In this solution filter paper is dipped and dried at 100° C. This blue paper is turned white in moist air, or with alcohol or ether which contains water.

MARECHAL'S—Test for Biliary Colors.—On adding 2 or 3 drops of tincture of iodine to an acid or neutral urine, an emerald green color is produced, if biliary colors are present.

MARME'S—Test for Alkaloids (Potassio-cadmic-iodide).—To a boiling concentrated solution of potassium iodide (4p. to 12p.) in water, cadmium iodide (2p.) is added to saturation, this is then mixed with a like volume of a cold saturated solution of potassium iodide. The concentrated solution is permanent, but not in diluted condition. It gives yellow to white precipitates with alkaloids.

MARQUE'S—Test for Sparteine.—Sparteine sulphate, when warmed with ⅓ of its weight of chromic acid gives a green color (due to reduction); also an odor of cicutin is developed.

MARSH'S—Test for Arsenic.—(See text-books on Chemistry.)

MASIN'S—Solution.—A solution of potassio-mercuric-iodide of same composition as Mayer's Solution.

MASSET'S—Test for Biliary Colors.—See Gmelin's Test.

MAUGIN'S—Reagent.—An ammoniacal oxychloride of ruthenium, used for miscroscopical examination of tissues.

MÂUMENE'S—Test for Distinguishing Oils.—The increase of temperature produced by mixing the oil with concentrated sulphuric acid is noted; drying oils generate a greater degree of heat than the non-drying.

MAUMENE'S—Test for Glucose.—Skeins of white wool are dipped in a 33 per cent. solution of zinc chloride and dried. When moistened with a glucose solution and heated to 130° C., the threads are colored brown to black.

MAYER'S—Alkaloidal Reagent.—A solution of potassio-mercuric iodide made by dissolving 13.546 grams of mercuric chloride and 49.8 grams of potassium iodide in water sufficient to make one liter. Most alkaloids give a white precipitate with this reagent in acid solution. This reagent is also employed in the quantitative estimation of alkaloids. Sometimes called Planta's, Tanret's or Winkler's Reagent.

MEHU'S—Test for Albumin.—A solution of phenol 1 part, acetic acid 1 part, and alcohol (90 per cent.) 2 parts, which precipitates albumen in presence of nitric acid or sodium sulphate. It is best to add to the sample of urine one-half its volume of a saturated solution of sodium sulphate.

MELLASSEZ'—Solution.—Used in preparing Teichmann's hæmin-crystals. A solution of specific gravity 1.050 to 1.057, containing 3.75 parts of mucilage (probably acacia), 1.875 parts of sodium sulphate, 1.03 parts of sodium chloride and 100 parts of water.

MERGET'S—Test for Mercury.—A piece of gold foil which has been coated with mercury (Dipping the foil in a sample of urine containing corrosive sublimate, to which stannous chloride has been added) is enveloped in tissue paper, this is covered with a piece of paper which has been dipped in ammoniacal silver nitrate solution and finally the whole wrapped in a dry piece of filter paper. The enveloped piece is pressed, and if mercury is present, in a few minutes the inner side of the filter paper will have become brown.

MERGET'S—Test for Moisture.—Depends upon employment of such salts as palladium chloride or mercurous chloride, which possess different colors in the anhydrous and hydrated conditions. (Compare Mann's Reagent.)

(To be continued.)

*THE FOUNDATION OF CHEMISTRY AS A QUANTITATIVE SCIENCE.**

By C. A. HILL.

When reading an historical account of experimental inquiries made long ago in chemistry, one is bound to perceive how widely the science of to-day differs from the alchemy of olden times; but one difference, I think forces itself upon one again and again, viz.: In the point of view from which any new discovery is regarded, the manner in which it is followed up, and the way in which it is utilized. To instance what I mean: Our ancestors, the alchemists, could observe that a certain, perhaps new, substance was formed when two bodies were brought together, and when they had more or less examined the properties of this body, and had given it a name, they were content. Now, however, when we remark the formation of a substance under certain fixed conditions, we attempt to determine how much of it is formed in relation to the amount of the reacting bodies. For modern chemistry is a quantitative science; to assert that chemistry is more than this is also correct; but that in its truest and most important aspects, it is essentially a science of measurement—whether of mass or of volume—probably no one will deny.

The ideas held by some chemists during the latter half of the seventeenth century were in some respects in advance of those subsequently held. For instance, Boyle, who was altogether far ahead of his contemporaries, observed that the "calces" form when metals are calcined in air, weigh more than the original metals, and this fact was later ignored by Stahl. Again, the theory of combustion put forward by Hooke and Magow resembles closely the one we now believe to be correct. Magow, in 1669, shows us that he clearly recognizes the fact that there is something in the air which combines with metals when the latter are calcined.

Unfortunately for chemistry Magow died when only thirty-four years of age, and a very different theory of combustion was started by J. J. Becher. This chemist supposed all inorganic matter to be made up of three "earths," the "mercuriat," the "vitreous," and the "combustible." This last he assumed to be a component of all combustible bodies, and his idea of combustion was that the "combustible earth," or "terra pinguis" escaped, the other component or components of the substances remaing behind. When metals are calcined a "calx" results; therefore, argued Becher, the metal is a compound of the calx with "terra pinguis." Becher's work owes its recognition in great measure to the subsequent labors of Stahl. The last named chemist explained the phenomena of combustion and the like pretty much as Becher had; before there was considerable difference of opinion as to whether several principles such as Becher's "terra pinguis" existed, or only one. Stahl decided in favor of the latter alternative, and called it "phlogiston."

In the overthrow of this phlogiston theory, which held sway for a hundred years, and in the recognition of the part played by oxygen in combustion, the foundation of modern chemistry consists; and it was only by careful quantitative experiments that Priestley and Cavendish discovered the facts which enabled Lavoisier to place modern chemistry on a firm basis; therefore, if chemistry as we know it had not been first a quantitative science, it would not have existed.

About the middle of the eighteenth century Black carried out his classical researches on the carbonates of the alkalies and alkaline earths. Black proved that the carbonates of magnesium and calcium (mild alkalies) on being strongly heated became caustic; that the resulting caustic alkalies are lighter than the original "mild" alkalies; and that this difference in weight is due to the loss of "fixed air" (carbon di-oxide). Throughout these investigations into the composition of bodies Black made the balance an essential part, so these experiments may be taken as the beginning of quantitative chemistry.

The latter part of last century is known as the "pneumatic period" of chemistry, because chemists paid so much attention to the study of gases. Many analyses of air were made, and various were the reagents used for absorbing the oxygen. Priestley used nitric oxide for his "dephlogisticated air"—a method which gave very variable results; Scheele absorbed his "fire air" with ferrous hydroxide, ferrous sulphide, phosphorus, etc.; while Cavendish, carrying out a suggestion first made by Volta, exploded with hydrogen.

Both Boyle and Magow knew that there was one constituent of the air which supported combustion and respiration, but neither was able to isolate it. Joseph Priestley discovered oxygen in 1744, two years after the discovery of nitrogen by Rutherford. There is little room for doubt that Scheele prepared oxygen about three years before Priestley's discovery, but his work was unfortunately not made known to the rest of the scientific world till a much later date, and it is with Priestley's discovery that we are concerned.

Priestley believed firmly in the phlogiston theory, which he did so much to destroy; though he mixed hydrogen with air, burnt the mixture, and noticed the formation of water, he was unable to realize the meaning of the phenomenon. Quick in his reasoning, and brilliant in his discoveries, he presents a striking contrast to Cavendish, who was slow in drawing conclusions, thorough and exhaustive in his work, and above all, and more than any one before him, quantitative. In 1771 he proved the composition of the atmosphere to be constant, and his numbers agree well with the most accurate analyses that have since been made. He also determined the proportions of air and hydrogen which should be mixed in order to give the maximum quantity of water on explosion, and having found that 423 measures of hydrogen phlogisticate 1,000 measures of air, he wrote: "We may safely conclude that when they are mixed in this proportion and exploded, almost all the inflammable air, and about one-fifth part of the common air lose their elasticity, and are condensed into dew." Next he substituted oxygen for air, and the result of exploding "inflammable air" with "dephlogisticated air" in certain proportions was the epoch-making discovery—the importance of which it is indeed hard to overestimate—of the quantitative composition of water. Cavendish, in fact, had discovered that water is composed of inflammable air and dephlogisticated air in certain proportions, but he did not correctly interpret his own results; he remained to the end of his days an upholder of the phlogiston theory, regarding phlogiston as identical with hydrogen, but afterwards, changing his opinion, he considered hydrogen to be a compound of phlogiston with water.

James Watt, the engineer, was nearer the truth when he wrote to Cavendish saying, "Water is composed of dephlogisticated and inflammable air."

In 1772 Lavoisier began investigating the phenomena of combustion. He found that when phosphorus is burnt, not only is there no loss in weight, but actually an increase; from this he inferred what was inevitable and correct, viz., that a portion of the air had become "fixed." To confirm this view he took calx of lead (that is, the substance obtained when lead is heated in air, and which has, therefore, absorbed some air), and heated it with charcoal—there was a liberation of gas. Some experiments were made by Magow and Boyle, Lavoisier repeated and amplified. One experiment of his in particular I should like to mention: A retort containing some tin was sealed up and weighed. It was now heated, and then weighed again, when no change in weight was observed. On opening the retort air rushed in, and it was now found to have increased in weight. The tin, the initial weight of which was known, was now removed and weighed again; this also weighed more than at the beginning of the experiment, and the increase in weight of the tin was exactly the same as the increase in weight of the whole apparatus. Hence, Lavoisier concluded that the absorption of air is the cause of the increase of weight which takes place on calcination.

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* Read before the Chemists' Assistants' Association. Abstract in Br. and Col. Dr.

Lavoisier had a goodly array of facts at his disposal, and his great service to chemistry consisted in deducing from this empirical knowledge rational logical conclusions.

What gave him a clearer insight into the phenomena of combustion and the like than was possessed by others, and enabled him to give for the first time a correct explanation of the same, was the fact that he attached great importance to the weight of the initial and resultant substances in every reaction, making the balance his constant companion in every investigation.

The metals, and combustible bodies generally, were regarded as compounds, while their calces, acids, etc. (that is, their oxidation products) were regarded as elements. Lavoisier exactly reversed this.

Old view:

Metal = phlogiston + calx.

Phosphorus = phlogiston + phosphoric acid.

Modern view:

Metal + oxygen = calx, or metallic oxide).

Phosphorus + oxygen (+ water) = phosphoric acid.

The phlogistonists regarded combustion as a decomposition; we regard it as a combination.

Quite at the end of last century J. B. Richter published the results of his researches on the quantitative composition of metallic salts. The doctrine of "proportions by weight" was the outcome chiefly of this work. Wenzel had already proved that acids and bases combined in fixed proportions, when Richter, after having shown that two neutral salts give rise by mutual decomposition to two new salts, set himself the task of determining the proportions of acid to base in salts, and from his own experiments he deduced his far-reaching "Law of Neutralization," which states that "the quantities of different bases, which neutralize a given fixed quantity of an acid, contain the same amount of oxygen."

Within ten years of Lavoisier's death appeared Claude Berthollet's "Essai de Statique Chimique," in which he attempted to explain chemical action on a purely mechanical hypothesis, neglecting altogether the existence of chemical affinity. According to this hypothesis, by varying the mass of one of the re-acting bodies in a chemical reaction, the resulting body would be varied in composition, so that Berthollet maintained that there were no fixed combining proportions, and thought he proved that the oxides of a metal (in the case of a metal forming more than one oxide) contain gradually increasing amounts of oxygen. Proust showed, however, that Bethollet had analyzed mixtures, and in some cases hydrates, and proved that the amounts of oxygen contained in the different oxides of a metal are fixed, not variable, and that they increase by sudden increments, not gradually. He thus discovered the law of multiple proportions, but his analyses were not sufficiently accurate to enable him to deduce this law. He could not see that the quantities of oxygen in the higher oxides were multiples of those contained in the lower oxides, though he could see that they were fixed and increased abruptly, so it was left for John Dalton to make this discovery. Dalton stated the varying quantities of an element B, which combine with a certain fixed quantity of an element A in terms of this fixed quantity. The multiple proportions were then obvious. Without giving a detailed account of the experiments which led to the enunciation of Dalton's atomic theory, I shall content myself with saying that he analyzed, as well as he was able, ethylene and methane, carbon mon-oxide and dioxide, and then nitrous oxide, and nitric oxide; and from the results of these very analyses he deduced his law of multiple proportions. Dalton did not stop here, however; he sought an explanation of these remarkable numerical relations, and found it in his "atomic hypothesis," which, now that it is universally accepted, we designate a "law." Such is the account which has for years been accepted as correct, but quite lately further evidence on this point has come to light in the shape of some of Dalton's manuscript, laboratory notebooks, and it would seem, as Sir Henry Roscoe tells us, that Dalton proposed his atomic theory from purely physical considerations, and in confirming his theory by the chemical analyses of the bodies I have mentioned, he discovered the law of multiple proportions.

The latter serves as an excellent example of the superiority of quantitative ideas over qualitative, for I may remind you that atomic theories of one sort or another have been known for more than 2,000 years. The theory of atoms was founded by Lucippus and Democritus about B. C. 400. Democritus taught that the universe was made up of atoms, homogenous in quality, heterogeneous in form; that these atoms combine with one another, and that all things arise from the infinite form, order, and position of the atoms in forming combinations.

An atomic theory was propounded shortly before Dalton's by Mr. William Higgins. In this the author held that atoms combine to form the molecules of compound bodies, and that they must unite singly, or by twos or threes (!).

Higgins supposed the weights of the atoms of various elements to be the same. Dalton declared them to be different, and that "the relative atomic weights of the elements are the proportions by weight in which the elements combine." He made two great enunciations:

1. Every element is made up of homogeneous atoms, whose weight is constant.

2. Chemical compounds are formed by the union of the atoms of different elements in the simplest numerical proportions.

Dalton's hypothesis was a chemical one, and it was a quantitative one, and these two differences between it and other atomic theories gave it the place it now holds in chemical science.

Palatable Cascara Preparations.

By LEO C. URBAN, Milwaukee, Wis.

In most of the published formulæ for making bitterless cascara preparations, calcined magnesia is employed. Recently Gilpin gives a process for the preparation of a bitterless cascara in which the same agent is used. The National Formulary process for making aromatic fluid extract of cascara likewise employs calcined magnesia for the removal of the bitter principle.

The same results are obtained by the use of freshly slaked lime at a proportionally lower cost. The following formula for Aromatic Fluid Extract of Cascara will serve as an illustration of the method of procedure:

Cascara sagrada	1,000 grams
Licorice root	150 grams
Freshly slaked lime	100 grams

The lime is thoroughly mixed with the ground drugs, and the mixture kneaded with 1,000 cc. of water. This is allowed to macerate for ten or twelve hours, and then dried at a temperature of between 40° C. and 50° C. It is then moistened with 400 cc. of a menstruum composed of

500 cc. alcohol
250 cc. glycerin.
250 cc. water.

It is then firmly packed in a percolator and the balance of the menstruum poured upon it, followed by water sufficient to exhaust the drug. The first 850 cc. of the percolate are reserved; the weaker percolate is evaporated to a syrupy consistence, and added to the first percolate. The aromatics, say 12 cc. of compound spirit of orange, are added, and lastly sufficient dilute alcohol to make 1,000 cc.

The resulting preparation is very palatable, and possesses the cathartic properties of cascara in a marked degree.—Phar. Rev.

QUESTION BOX

The object of this department is to furnish our subscribers with reliable and tried formulas and to discuss questions relating to practical pharmacy, prescription work, dispensing difficulties, etc.
Requests for information are not acknowledged by mail and ANONYMOUS COMMUNICATIONS RECEIVE NO ATTENTION

Unanswered Query.

(C. E. J.) Topeka. See rules at the top of this column.

Formula Wanted.

(M. J. H.) Roubiquet's discovery.

Almond Cream.

(G. D. S.) See this journal, Jan. 14, 1897, page 42.

Aromatic Elixir.

(J. K.) See page 107, United States Pharmacopoeia.

Oil of Stone.

(S. S.) "Oil of Stone" is an old name for crude petroleum.

Solution of Peptonates of Iron and Manganese.

(D. A. B.) See this journal, Oct. 17, 1895, page 496 and July 2, 1896, page 13.

Liver Regulator.

(J. K.) See this journal, Nov. 12, 1896, page 632. We cannot give the formula for the proprietary article.

Boiler Compounds.

(I. K.) See this journal, Nov. 26, 1896, page 698, and Jan. 14, 1897, page 41 (Purification of Water). We cannot give the formula for the proprietary article.

Manufacturers of Blowpipes.

(J. L.) Any manufacturer upon request will give you information as to the best blowpipe for analytical purposes, jeweler's work, etc. Address Whitall, Tatum & Co., or Fox, Fultz & Co., this city.

Magendie's Solution.

(J. L.) Magendie's solution contains 16 grains of morphine sulphate to the fluid ounce of distilled water. See formula and remarks in National Formulary, revised edition. We cannot give the formula for the proprietary preparation you name.

Syrup Pleurisy Root.

(W. M. R.) We know of no specific formula for a preparation of this character. A formula for compound syrup of pleurisy root is this one:

Fluid extract pleurisy root	2 fl. ounces
Fluid extract ipecac	¼ fl. ounce
Fluid extract opium (aqueous)	¼ fl. ounce
Syrup	8 fl. ounces

Pleurisy root is said to be diaphoretic, antispasmodic, tonic, diuretic and carminative. It has been used in diseases of the respiratory organs, more particularly in pleurisy, inflammation of the lungs and catarrhal affections.

Hair Invigorator.

(R. P. C.) Oil of bergamot is immiscible in aqueous solutions, or solutions made with glycerine. Hence the difficulty with the process you tried. Here is a formula which is said to make a preparation without sediment: It should be kept from light.

Lead acetate	1½ ounces
Sodium hyposulphite	5 ounces
Glycerine	1 pint
Alcohol	½ pint
Oil of bergamot	2 fl. drams
Oil bitter almond	½ fl. dram
Rose water	2 pints
Water, enough to make	1 gallon

Dissolve the lead acetate and sodium hyposulphite, each separately in two pints of hot water, and mix the solutions. Dissolve the oils in the alcohol, adding two pints of water, and rub with half an ounce carbonate of magnesium in a mortar, filter and add the filtrate to the other mixture, then add the glycerin and enough water to make a gallon.

Tincture Ferric Chloride and Oil of Wintergreen.

(W. P. S.) asks how to dispense the following prescription:

Tincture ferric chloride	½ ounce
Tincture nux vomica	2 drams
Quinine sulphate	20 grains
Oil of gaultheria	10 drops
Water enough to make	8 ounces

This prescription may be dispensed as written, although it is doubtful whether the prescriber considered the reaction occurring between tincture ferric chloride and oil of gaultheria (methyl salicylate), violet-colored ferric salicylate being produced when these are combined. If dispensed, the mixture should be sent out bearing a "shake" label.

Female Regulator.

(I. B. W.) We do not give the formulas for proprietary preparations because we cannot vouch for their accuracy. Proprietors, as a rule, keep these secret and chemical analysis has not yet arrived at the point where it is able to estimate exactly the composition and proportions of a preparation made up wholly or in part of substances of organic derivation. Whether a given formula simulates any patent medicine you are quite as able as we are to decide. The formulas in this journal, pages 618 and 110, May 14, 1896, and Jan. 28, 1897, issues, respectively, are typical formulas of the class represented by the compound elixir of viburnum opulus of the National Formulary.

Coloring Benzine.

(B. F. T.) It has been stated that benzine and allied petroleum products may be colored by alkanet root, but some experimenters have reported very unsatisfactory results. Various experiments with anilines readily obtainable in stores have also been reported; the results have not been satisfactory. We would suggest that you experiment with some of the aniline colors yourself. Write to the dealers, stating plainly that you want color substances soluble in benzine, and then a few practical trials will show you the degree of success obtained. If you are successful with your experiments, report them for the benefit of others, for this subject has never been fully investigated.

Hair Restorative.

(W. M. R.) We cannot give you the formula for the proprietary preparation. However, the following, taken from the Era Formulary, may answer your purpose:

Castor oil	2 quarts
Linseed oil	4 ounces
Tincture cantharides	4 ounces
Alcohol	13 quarts
Bergamot oil	2 ounces
Lemon oil	1 ounce
Clove oil	½ ounce
Neroli oil	2 drams

Mix the two fatty oils and dissolve them in the alcohol by agitation. Then add the tincture of cantharides and the perfumes, and color red with cochineal tincture or henna tincture.

Transmission of Emmenagogues and other Preparations Through the Mails.

(A. S. S.) Reference to the United States postal regulations reveals that the mails may be used for the transmission of any article not poisonous, explosive or inflammable, and such articles or substances which will in no way damage or destroy the mails or injure the persons handling them. Medicines can be thus transmitted (liquids, if they are secured and packed in a manner prescribed by the Post Office authorities). But the mails cannot be used to transmit matter to fraudulent enterprises or concerns, nor are they to be used for the transmission of illegitimate, obscene or immoral articles. An emmenagogue preparation prescribed by a physician and used for a legitimate purpose can be transmitted through the mails the same as any other medicine, so long as it does not conflict with the postal regulations.

Gesundheitssalz.

(O. E. H.) By "Sundhet salt," a formula for which you make inquiry, is probably meant the German or Danish preparation known as "gesundheitssalz," sometimes known as "pulvis halodiaeteticus," for which Hager gives this formula:

Sodium bicarbonate	30 parts
Potassium chlorate	15 parts
Calcium phosphate	10 parts
Iron pyrophosphate	7.5 parts
Calcined magnesia	7.5 parts
Calcium fluoride	2 parts
Silicic acid	2 parts

Hager gives this formula for the "gesundheitssalz," Bloch, Copenhagen:

Sodium bicarbonate	14 parts
Magnesium carbonate	1 part
Peppermint oil sugar	1 part

Sodium bicarbonate is sometimes dispensed for this preparation.

Salicylic Acid and Quinine in a "Shake Mixture."

(C. S. W. D.) A satisfactory mixture cannot be made from the following prescription:

Salicylic acid	½ ounce
Quinine sulphate	2 drams
Syrup yerba santa	2½ ounces
Cinnamon water, enough to make	4 ounces

Upon allowing the mixture to stand a short time the quinine and the greater part of the salicylic acid collect in a hard lump, which cannot be completely disintegrated by shaking. Both salicylic acid and quinine are comparatively insoluble in aqueous solutions. Hence were there no other considerations, that one of a small mixture containing so large a proportion of insoluble, bulky, dry substances, a heavy syrup, and but little water would be enough to condemn it, even as a "shake" mixture. But as you surmise, salicylic acid no doubt throws out some of the resin in the syrup, which tends to make the quinine, acid, etc., agglutinate.

Expansion of Bromine at the Freezing Point.

(G. J. H.) Extended research through reference works and consultation of authorities is necessary to furnish you full data upon the statement: "It is held by some that when bromine is frozen in a glass tube, it, unlike ice, will not break the tube by expansion." However, the following may be of service. Bromine solidifies to a crystalline mass at —7° C. (Newth); bromine freezes to a brown crystalline solid at —4° F., 20°C. (Tidy); bromine freezes to a reddish-brown solid at —22° C. (Roscoe & Schorlemmer); bromine forms a red crystalline solid at 9.5° F. (Miller); bromine * * * * contracts at the moment of solidification, and, of course expands on liquefaction (Miller, "Elements of Chemistry," Part I., Chemical Physics, page 100). Expansion of bromine at different temperatures: At —7° (true coefficient), 0.001, 0.016, 0.027; mean coefficient of expansion, 0.00; 970, 234. At 0° (true coefficient), 0.00, 0.38, .186. At 63° (true coefficient), 0.001, .810, .947. Mean coefficient, 0.001, 167, 673. (Gmelin's "Handbook of Chemistry," London, 1848.)

Chinese Stink Pots.

(G. J. H.) Wilhem's "Military Dictionary" states that the Chinese "stink pot" is a shell, often of earthenware, which, on bursting, emits a foul smell and suffocating smoke. No analysis of its composition is reported, but it is supposed to be a combination of sulphur and phosphorus dissolved in bisulphide of carbon, and to which some mineral oil is occasionally added, with a view of increasing its incendiary properties. When this composition is thrown on any surface the solvent evaporates, leaving a film of phosphorus or sulphide of phosphorus, which inflames spontaneously. Chloride of sulphur may be substituted for bisulphide of carbon, the ignition, however, not taking place quite so soon, thus giving time for the liquid to penetrate into woodwork and canvas. An abominable odor is diffused during the combustion. Wilhelm says the proper mode of extinguishing such a fire is to throw over it damp sand, ashes, sawdust, wet sacking or carpeting, or any material which will exclude the air from the fire. No attempt should be made to remove the covering for some time, and the place should then be washed by a powerful jet of water forced upon it.

Fungus Growth in Saturated Solution of Boric Acid.

(W. J. K.) We cannot account for the "fungus growth" in your solution. The change has been frequently observed in cocaine solutions containing boric acid, though it is generally considered that such growths do not develop in saturated aqueous solutions of boric acid. In fact, in reply to a query from the New York State Pharmaceutical Association regarding the alleged development of these growths, a Brooklyn chemist reported that in a series of test liquids prepared for that purpose, which were examined from time to time, he had failed to find any germs which could have developed therein. A recent saturated solution of boric acid purposely infected with a fungoid growth from a solution of sulphate of strychnine, did not develop any more of it, but he reported the boric acid was unable to destroy or kill it entirely. A saturated four per cent. solution of boric acid has been found in general to render the lower organisms inert or inactive. In preparing solutions of this character for hypodermic use, eye lotions, etc., care should be taken to use freshly distilled water, a thoroughly clean bottle, etc. Only a small quantity should be put up at once, and only then for immediate use. The continued action of light and exposure is favorable to the development of these growths.

Polish for Axe and Pick Handles.

(W. D. B.) wants a very cheap polish, which may be applied by means of a belt covered with cork to axe, pick or other wood handles. The following have been suggested. Just how well they will work requires a little experimenting to determine:

(1)	Yellow wax	125 parts
	Hard soap	30 parts
	Glue	60 parts
	Soda ash (80°)	125 parts

Water and whiting, a sufficient quantity.

Dissolve the soda in 2,000 parts of water; add the wax; boil down to 1,250 parts, and add the soap. Dissolve the glue in 500 parts of water by the aid of heat; stir in the whiting, and mix the whole with the solution of wax and soap.

(2)	Beeswax	½ pound
	Yellow soap	¼ pound
	Water	5 pints

Boil to a proper degree of consistence, with constant agitation, then add boiled oil and spirit of turpentine, of each, ½ pint. For use dilute with water.

(3)	Wax	4½ ounces
	Soap	½ ounce
	Spirit turpentine	½ pint
	Boiling water	½ pint

Melt the wax in a covered jar by gentle heat; add the turpentine carefully, and then gradually add the soap, previously dissolved in the water, and stir until stiff.

Volatile Oils by Fermentation.

(Clerk). There are two official volatile oils derived by the action of a ferment, viz., volatile oil of mustard and oil of bitter almond. Black mustard contains besides a fixed oil myrosin, an albuminous body, and myronic acid, a glucoside. After the fixed oil is removed by pressure the drug is macerated with warm water, whereby the myronic acid is split up into allyl sulphocyanate, acid potassium sulphate and glucose, thus:

$$\underset{\text{Myronic Acid}}{C_{10}H_{18}KNO_{10}S} = \underset{\text{Allyl Sulphocyanate}}{CSN\text{-}C_3H_5} + \underset{\text{Glucose}}{C_6H_{12}O_6} + \underset{\text{Acid Potassium Sulphate}}{KHSO_4}$$

The volatile oil formed is removed by distillation.

Oil of bitter almond, known also as aldehyde of benzyl alcohol or benzaldehyde, is obtained from the bitter almond, after the removal of the fixed oil, by macerating in distilled water and then removing the generated oil by distilling over with steam. There is present in the bitter almond a ferment (emulsin) which in the presence of water causes the glucoside amygdalin to break up into benzaldehyde (oil of bitter almond), hydrocyanic acid and glucose, according to the following equation:

$$C_{20}H_{27}NO_{11} + 2H_2O = C_6H_5COH + HCN + 2C_6H_{12}O_6$$

Size of Mixture.

(Subscriber) wants to know what will be the quantity of finished product in each of the following prescriptions:

No. 1.

Syr. ferri iodidi	1½ drams
Syr. sarsaparilla,	
Syr. stillingia compound. aa., quad...	1 ounce

No. 2.

Syr. ferri iodidi	1½ drams
Syr. sarsaparilla,	
Syr. stillingia compound. quad.......	2 ounces

The best any one can do with either is to pass an opinion upon it, which, however, does not definitely answer the question. The physician is the only one who can answer. Assuming the word here written "quad" to be intended for the abbreviation "q. s." (quantum sufficit), and the adverbial preposition "ad" (up to), we think there can be not very much doubt that the prescriber intended enough of the mixture of equal parts of syrup sarsaparilla and compound syrup of stillingia to be used to make the quantities measure one and two ounces, respectively. When correctly employed "ad" indicates the use of a quantity necessary to complete a certain measure, and strict usage would compel it to be applied to but one ingredient. If in the first prescription after the abbreviation "a a" the prescriber had specified "partes æquales" (equal parts), and had supplied this information in the second prescription, there would have been no question as to his intentions. Why not consult him?

Formulas for Confectionery.

(W. A. H.) The manufacture of confectionery is a subject rather outside the scope of a pharmaceutical journal, and we cannot, therefore, publish all the formulas and processes for which you ask. A formula for making "burnt almonds" is here given; for other information we would refer you to such books as Frye's "Practical Candy Maker," for confectioners and others, $5; Weatherley's "Treatise on the Art of Boiling Sugar, Crystallizing, Lozenge Making, Comfits, Gum Goods, Etc.," $1.50; "Notes on American Confectionery," $2.

Burnt Almonds. (Frye.)

Take six pounds of Jordan almonds, six pounds of sugar, and one quart of water. Put part of the sugar on the fire, and, when it comes to a boil, add the nuts, and cook over a very slow fire until the nuts cease to crack; in this way the nuts will be thoroughly roasted. Then set off the basin, and stir and turn the batch until the sugar granulates; throw all into a sieve, and shake the loose sugar off. Put this into a basin, with a little water to dissolve it. Cook it to a soft ball; remove the basin from the fire and add the nuts; stir and turn the batch until the sugar again granulates; throw into the sieve and shake off the loose sugar as before. Put it into the basin with enough sugar added to make six pounds; add water to dissolve, and color a deep red; cook to a soft ball; remove, and add almonds as before; while granulating the sugar this time, add one teaspoonful of ground cinnamon. Now, put into the basin one pint of dissolved gum arabic, made black by adding burnt sugar color to it; set off and throw in the almonds; stir again, throwing the nuts over and over, until all are covered with the gum; then spread them out on a tray, and put in a warm place to dry. To make a hard coating, cook the sugar to a hard crack, or 290 degrees each time, instead of a soft ball; this kind will retain the gloss much longer, but the soft coating is the most popular.

Nickel and Silver Plating Solutions.

(H. L. S.) The "clear" solution sometimes sold by peddlers for nickel plating is a solution of nitrate of mercury, the plating deposited upon the metal being nothing more than metallic mercury. Here is a process for nickeling without a battery: In a vessel of porcelain, or preferably copper, place a concentrated solution of chloride of zinc, dilute with from one to two volumes of water, and heat to boiling. If a precipitate separates it is to be redissolved by adding a few drops of hydrochloric acid. A small quantity of powdered zinc is then thrown in, by which the vessel becomes covered with a coating of zinc. Either the chloride or sulphate of nickel is then added until the liquid is distinctly green; and the articles to be plated, previously thoroughly cleaned, are introduced, together with some zinc fragments. The boiling is continued for fifteen minutes, when the coating of nickel is completed. The articles are then well washed with water and cleaned with chalk. If a thicker coating is desired the operation is repeated.

Silvering Solution.

Sodium bisulphite	10 ounces
Distilled water, enough to dissolve.	
Nitrate silver	264 grains
Distilled water	2 ounces

Dissolve the salts separately and mix the solutions. Allow the article to remain in the mixture until it is properly coated; remove and wash with water, to which a small amount of sodium bicarbonate has been added; finally wash with water and dry in sawdust. For formulas and processes used in connection with a battery see this journal, Feb. 27, 1896, page 272.

PHARMACY.

GERMOL.—An antiseptic similar to cresole.

VASOL.—A combination of petrolatum and ammonium oleate.

TAR ACETONE.—A solution of wood-tar in acetone, used in skin diseases.

IODOFORM-SALOL.—A mixture obtained by fusing together iodoform and salol.

SOZOBORAL.—A mixture of aristol, sozoiodol and borates, used in colds as a snuff.

GALLOBROMOL.—A di-bromo-gallic acid, which is recommended as a substitute for bromides in treatment of gonorrhœa.

AMYLOCARBOL.—A solution of phenol 9 parts, green soap 150 parts, in 160 parts of amyl alcohol, to which water is added to make 1,000 parts.

ADHAESOL.—An ethereal solution of benzole, tolu balsam, copal resin, oil of thyme and alpha-naphthol.

REDUCTION BY CALCIUM CARBIDE.—The use of calcium carbide as a metallurgical reducing agent is described by H. N. Warren (Ch. News. Ph. Jr.). On excess of litharge being heated to redness with the carbide, metallic lead and calcium oxide result, the reaction being accompanied by vivid incandescence. When the carbide is in excess carbon dioxide is evolved, and a regulus of calcium and lead obtained, of varying percentage, according to the temperature employed. The alloys thus formed are all more or less brittle, and to a certain extent sonorous when struck. Their melting points rank below that of pure lead, and they are slowly but completely decomposed in contact with aqueous vapor, the reaction being much less energetic than that afforded by alloys of lead with the alkali metals. Stannic, cupric, and ferric oxides are readily reduced by the carbide, but yield results of no practical value, while magganese, nickel, cobalt, chromium, molybdenum and tungsten oxides yield calcium alloys on reduction.

A VEGETABLE PUMPING ENGINE.—This is the title bestowed upon the ordinary tree by Sir Benjamin Ward Richardson. In a recent address, quoted in Cassier's Magazine (Sci. Amer.), he says: "Hydraulic engineers would be sorely puzzled to explain how the large quantity of water required to supply the evaporation from the extended leaf surface is raised to heights up to 400 feet and above. We know that the source of energy must be the sun's rays, and we know further that, in the production of starch, the leaf stores up less than one per cent. of the available energy, so that plenty remains for raising water. Experiments have shown that transpiration at the leaf establishes a draught upon the sap, and there is reason to believe that this pull is transmitted to the root by tensile stress. The idea of a rope of water sustaining a pull of perhaps 150 pounds per square inch may be repugnant to many engineers, but the tensile strength and extensibility of water and other fluids have been proved experimentally by Prof. Osborne Reynolds and by Prof. Worthington and others."

AN IMPROVED BUNSEN GAS BURNER.—Dr. K. Bierbach, of Berlin, has made a material modification of the ordinary Bunsen burner, says the Progressive Age Sci. Am.). The Bunsen burners now in use suffer from too great rigidity of form, which makes it impossible to use the burner for certain purposes. A lateral heating of apparatus can be accomplished by the ordinary Bunsen burner with difficulty only, while in some cases it is entirely out of the question. Yet it is frequently a necessity, for instance, in the distilling of liquids possessing a very high boiling point, or of those which are violently agitated by boiling; or it is desirable for other reasons to place the burner not under but beside the apparatus. The improved burner is so constructed that its flame can be moved in every direction like the stream of a fire engine. The burner consists of a mixing tube for gas and air bent in a right angle so as to form a long shank and a shorter one. The long shank is so arranged in a ring provided with a screw that it can be turned and moved in the ring. The ring can be turned around the axle of a vertical joint which rests upon a flat plate-shaped foot. By this triple action the knee tube can be put into any position desired, and the mixture of gas and air can be conducted through it in both directions by means of an adjustable rubber tube. When the gas is conducted through the lower shank the burner can be placed under the lowest apparatus, when it flows into the shorter shank the position of an ordinary Bunsen burner is obtained; by inclining it lateral heating can be accomplished.

PROCESS FOR DETECTING ADULTERATIONS IN SILK AND WOOL.—A newly discovered and almost infallible method of detecting adulterations in silk and wool, writes Consul Sawter, of Glauchau, Germany, has recently been receiving much attention and experiment in Germany. The materials employed in adulterating silk and wool are, as a rule, cotton, linen, and china grass, and so reliable and exact is this new system of detection, when used, that even 1 per cent. of any of the above-named spurious substitutes is immediately discovered and recognized. The method is as follows: A small piece of the suspicious material is taken and well cleaned, particular care being exercised to remove from the sample every particle of starch or gum dressing, a precaution which is most important to insure the success of the experiment. The prepared specimen of silk or wool is then steeped for from six to ten hours in sulphuric acid, with which some water is used to reduce its strength. After this part of the process and the required delay, the acid fluid is poured off and the acid soaked piece of cloth or silk placed in a porcelain vessel, to which is added sufficient alkali to turn a piece of litmus paper a deep violet in color; upon this is poured a few drops of a weak solution of archil, or orchil—a violet dye obtained from several species of lichen. The concoction is then heated for some minutes to 82° Celsius. If, after carefully observing all the above-mentioned directions, 1 per cent. or fraction thereof of spurious part composition or vegetable fiber exists the violet hue produced by the archil will have disappeared; if, on the other hand, the violet effect remains, it is considered absolute evidence and proof of the addition of vegetable fiber in adulteration of the material tried in whatever per cent. is indicated by the experiment.

ESTIMATION OF IODOFORM IN GAUZE.—Dr. Schacherl (Zeitschr. Oester. Apoth. Verein.) proposes the following method, which consists in decomposing the iodoform by means of sodium ethylate in a pressure flask and then estimating the liberated iodine (as KI), after Volhard's method. As pressure flask, the author employed a strong flask, the outer edge of the neck of which had been ground off perfectly level; over this a piece of rubber is placed, held in position by means of a piece of plate glass clamped on securely by means of an iron frame, which fits over the entire bottle.

Of the sample of gauze 1 to 1.5 gm. (30 to 50%), or 2 to 2.5 gm. (10 to 20%), are weighed off in the flask; over this is poured a cold solution of about 0.5 gm. of metallic sodium in 30 gm. of absolute alcohol, the flask is securely sealed and heated for one-half hour in a water bath. After cooling, the brown alcoholic fluid is decanted off and the gauze washed several times by decantation with distilled water. The mixed fluids are heated to drive off the excess of alcohol and evaporated to low bulk. The fluid is then acidified with pure nitric acid (free from nitrous) and filtered into a 200 cc. flask; to this an accurately measured volume of $\frac{N}{10}$ volumetric solution of silver nitrate (30 cc.) is added and water added up to the 200 cc. mark. The mixture is well shaken and filtered into a dry vessel. 100 cc. are drawn off, transferred to a flask, about 2 cc. of a saturated solution of ferric alum (free from Cl.) added, and then $\frac{N}{10}$ volumetric solution of ammonium sulfocyanide added until a permanent brownish coloration is produced. The number of cc. of the sulfocyanide solution used, multiplied by 2, is subtracted from the volume of the silver solution used; the difference gives the quantity of silver solution taken up by the iodine. Each cc. of the silver solution corresponds to 0.013086 gm. of iodoform.

Metallic sodium is employed here in producing sodium alcoholate, in order to avoid introducing traces of chlorine, as would be the case in using caustic soda.

Another portion of the sample (weighed) is extracted with alcohol in a Soxhlet's extractor, then dried at 100° C., and weighed. On adding the percentages of iodoform and gauze, and subtracting this from 100, the percentage of glycerin present is estimated.

NEWS OF THE WEEK.

CAMPAIGN AGAINST SUBSTITUTION.

DAILY NEWSPAPERS BEGIN INSTRUCTING THE PUBLIC AND PROPRIETORS APPEAL TO THE GOOD-NATURE OF RETAILERS THROUGH THE PHARMACEUTICAL PRESS.

The results of the conference between members of the Proprietary Association and the Newspaper Publishers' Association, held at the Hoffman House last week, are already apparent. From all parts of the country come newspapers with articles setting forth the evils of substitution. The advertising columns of the pharmaceutical press also teem with appeals to the good nature of druggists. It is learned that the conference held a week ago Tuesday and reported in last week's Era, was rather a contentious one. In the first place, the newspaper men did not clearly understand whether they were expected to discountenance cutting or substitution, and some of them did not appear to understand the meaning of these two terms. Prof. Munyon, who is not a member of the Proprietary Association at all, but is a heavy advertiser, proposed to the astounded publishers that they refuse to take advertisements from druggists or department stores that handled articles of their own manufacture which might be substituted for advertised goods. The newspaper men did not see the force of an argument to throw overboard $20,000 worth of department store advertising for $2,000 worth of homoeopathic medicine advertising.

The best speech of all was delivered by a newspaper man, Mr. Taylor, of the St. Louis Chronicle, who told what he knew about substitution in St. Louis. He told how a man in St. Louis called at a drug store for a bottle of Scott's Emulsion and received instead, without a word of explanation, a bottle labeled "Emulsion of Cod Liver Oil," and having at the bottom of the label the words "Prepared by J. D. Scott & Company, of St. Louis." He said that the same man went back to the store again and asked for Scott's Emulsion. This time he was told that there were two Scott's Emulsions, one made by J. D. Scott & Co., and the other by Scott & Bowne, and that the J. D. Scott & Co.'s emulsion was the better. Mr. Taylor submitted a lot of bottles to show how counterfeiting and substitution are carried on. He said he had been unable to find any such firm in St. Louis as J. D. Scott & Co. Mr. Bowne, who was incorrectly reported in last week's Era as having submitted the bottles himself, made a temperate speech. He said it was impossible to abolish the cutting evil; it had come to stay. He also said the retail druggist had a perfect right to manufacture pharmaceutical preparations on his own account. What he did object to was the substitution of an article of home manufacture when an advertised article was called for, and he believed this could be prevented by enlightening the public as to their rights.

The upshot of it all was the appointment of a joint committee from both associations to consider the subject. Accordingly Wednesday evening, at the Hoffman House, a dinner was presided over by Fred Whiting, of the Boston Herald, and attended by the committee and two or three others, as follows: Milton A. McRae, of the Scripps-McRae League; Maj. Richards, of the Indianapolis News; Frank B. Stevens, Mr. Bowne, V. Mott Pierce, George B. Bower, of the J. C. Ayer Company; Mr. Doliber and Professor Munyon. What was said and done there will probably never be known, because all interviewed afterward denied that anything had been agreed upon between the two great organizations interested. It seems to have been decided to let each publisher and each proprietor make such individual arrangements as suited them, now that the publishers fully realized how much in earnest the proprietors were about this thing.

Alleged Agents for a Drug Firm in Trouble.

Cleveland, Ohio, Feb. 19.—Three men, who represented themselves to be Chicago newspaper reporters, and who, as a side line, were alleged agents for the Mackenzie Drug Company of that city, were arrested on Wednesday night on three separate charges, the principal of these being that of obtaining money under false pretenses. In police court Thursday morning the three men pleaded "not guilty," and demanded a hearing, their cases being finally continued. The men are D. H. McDaniels, M. A. Barringer and Joseph Connell. McDaniels, against whom the police probably have no case, simply holding him as a witness against the other men, says that he has been in the employ of the Mackenzie Drug Company of Chicago since Dec. 8, 1896, and has been running a branch office of the company in the Society for Savings Building in this city. He was to employ sub agents, his salary to be $40 a month and commissions on the goods sold. McDaniels fitted out the Cleveland office at his own expense, and incurred other little bills amounting to something like $300, all of which the drug company was to pay him back on the first day of February. When the money was not forthcoming on that day he became suspicious, and with the consent of the Chicago people advertised the agency for sale. Several "reubens" bit, but none of them was so green as to pay the necessary $200 security, which the company demanded. Finally a man by the name of Davis agreed to buy the agency, the Mackenzie people offering him $1,000 a year as salary. The $200, however, was the "sticker" with him, but he finally made a deposit of $10 in the shape of a check. In the meantime Barringer and Connell were urged by McDaniels to come to Cleveland and help close the deal. They accordingly came, arriving here Tuesday morning. Instead of getting down to business at once, they hobnobbed with the reporters and desk officers at the Central police station, and made quite an impression.

Several of the people who had fallen into the trap had complained to the police, and the latter had turned the case over to the detective department, so that while the Chicago men were enjoying themselves in the police station and the detectives' apartments, the detectives were scouring the city for them. Late Wednesday night the detectives caught on to their game, and immediately arrested them. It is thought that the men are not bona fide representatives of the Mackenzie Company, as that company has been advertising extensively for the past several months, warning people to have nothing to do with the men.

The Lexow Senate Investigating Committee.

The Lexow Senate Investigating Committee, which has been stirring up the trusts and other large capitalistic combinations in New York State the last fortnight, paid some attention to the manufacturers of soda on Feb. 17.

William I. Warner, of the Church & Dwight Company, manufacturers of bicarbonate of soda, sal soda and saleratus, said that his firm had been incorporated July 1. 1896, with a capital of $2,000,000, after they had acquired a number of lesser firms. In answer to inquiries, he testified that an agreement had been entered into by which the jobber was not permitted to sell soda in New York and New Jersey at less than 5 cents a pound in packages and 4 cents a pound in bulk, under penalty of forfeiting a rebate, which was ½ cent per pound, and that he should sell only soda manufactured by Church & Dwight. He was asked whether he had a monopoly on the sale of soda in the State of New York. "I would not say we had a monopoly," he replied, "I think we sell more of it than anybody else." He said that the Wholesale Grocers' Association favored the system. John E. Dwight, of the same firm, testified in similar lines, and

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THE SUBSTITUTION PROBLEM.

A CAREFUL REVIEW OF THE CAUSES WHICH LED TO PRESENT CONDITIONS—HOW THE EVIL CAN BE REMEDIED.

At the recent annual meeting of the American Publishers' Association held in this city, by special request a number of the leading proprietors of proprietary medicines held a conference with these publishers of the large daily papers to give particular consideration to the subject of substitution. Nothing was accomplished at this conference except to refer the matter to a special committee consisting of three publishers and three proprietors, who were to suggest means for remedying this evil. While in one sense this might have been called a mercenary conference, it is by touching one's pocketbook that you get to his soul, and we believe that the public generally and the drug trade particularly are to be congratulated upon the fact that these two important factors are sufficiently aroused to give this subject of substitution their special study and consideration, the results of which should be beneficial to all classes of business men who are interested in the sale or marketing of these goods. If in years past these same proprietors and newspaper men had acted upon the advice of those who had studied the problem from the standpoint of the druggist, they would not at this late date be running up against the stone wall which now confronts them, and it is for the purpose of giving this esteemed committee the benefit of the druggists' side of this story that we offer these remarks.

To fully comprehend the situation it is necessary to turn back a few leaves in our story. In earlier days and before the birth of that commercial octopus, the department store, patent medicines were retailed exclusively by the retail druggists, and in towns where there were no druggists, by the so-called general store. A number of the leading proprietary medicines of to-day were introduced by consigning quantities of goods to these little country dealers, and, in fact, some of the old houses still continue thousands of these consignment accounts. As the railroads were multiplied and extended the jobbing druggist came into the field as the source of supply for the retailer, and the volume of trade drifted into that channel. It was considered that the average profit to the druggist should be from 33⅓ to 40 per cent. of his sales. The dollar articles were furnished to him at from $7 to $8 per dozen, and he retailed them at the full price of $1 for a single bottle, or six bottles for $5.

The business flourished, the manufacturers made money, the druggists made a profit on the goods and all were happy. The druggists distributed almanacs and circulars, the proprietor placed his advertisements in the papers and worked up a demand for his goods which the retailers supplied. In all of these advertisements the prices of the articles were invariably given, and this publication of these prices may, in one sense, be put down as the foundation for all subsequent trouble.

As years passed the enterprising department store came into existence, and about the first thing the proprietor began to do, in order to convince the public that he was selling goods cheaper than others, was to take some well known patent medicine, the retail price of which was thoroughly established in the minds of the public, and advertise it at a cut-rate. The so-called cut-rate drug store from necessity followed the example of the department store, and then the trouble began in earnest. The little retailer soon found that goods which cost him 66⅔ cents were being retailed by the department store at 67 cents, and he, for self protection, was compelled to sell something else. We wish to emphasize this statement, that the druggist was forced into the so-called substitution business in self-defense.

Every one will admit that drug stores in residence portions of a community are a great convenience. When one needs medicine, be it day or night, he does not want to be obliged to go several blocks or miles to find a drug store. These drug stores are not only a convenience but an absolute necessity in every community, and they should be supported. If the people go down town to the department store to buy their patent medicines, tooth brushes, toilet goods, and leave nothing but the prescription trade for the druggist, it does not leave sufficient for him to live upon.

The daily sales of these small stores will not average more than from $15 to $20 per day. It does not take very much of a mathematician to figure out what percentage of profit a druggist must have upon his sales in order to pay his rent, for his wood, his coal-oil, to the boy who does chores around his shop after school hours, and to leave a few slices of bread and an occasional beefsteak for the members of his family, if he is so rash or unfortunate as to be married. We read a great deal in the daily papers about the enormous profit of the druggist; in fact, these papers have been poking fun at the druggist so long that it seems almost second nature for them to continue it. If the editors of these papers are acquainted with any retail druggists who are burdened with riches, we would like to have them pointed out.

The plain fact is that there is no more intelligent, conscientious, hard-working, long-hours class of laborers in this country (and who are so poorly paid) than the proprietors and clerks in retail drug stores. A man will send for a carpenter to put up a shelf in his cellar, and he expects to pay the carpenter for the board, and the nails, and the screws, and the brackets, and fifty cents an hour for the man's time; but if he takes a prescription to a drug store and is charged 15 or 20 or 25 cents for labor, which can only be performed by one who has qualified himself by several years of study and experience, there is a howl; the druggist is accused of robbing because he charges twenty-five cents for a prescription which really contains only five cents' worth of materials. We beg of you, gentlemen of the press, to stop poking fun at the druggist and to be a little consistent in your criticisms of a very much over-worked, under-paid class of intelligent citizens.

When the department stores began to advertise patent medicines at cut rates, the proprietor, instead of stepping forward and trying to stop the practice and to keep his goods in the channels where they belonged, sat back in his chair, put his feet upon his desk, his thumbs in his waistcoat, and while smoking a good cigar, declared: "Well, I am a lucky dog! All of these big stores are advertising my goods in black type, and if this thing keeps on I won't even have any advertising bills to pay, for I can cut off the contracts that I have with those big daily papers." But such proprietor counted without his host, the little retail druggist, small, impecunious and brought up on a two-cent basis, but at the same time who was in touch with the people. Probably no one beside the physician knows more than the druggist about the family secrets or guards them more honorably, and when the poor woman goes around to the corner drug store for a bottle of sarsaparilla, she is pretty apt to be influenced by what her druggist recommends. Recent developments have proven that this version is more than correct. Now, the proprietor comes forward and asks the great daily papers to assist him in crushing these druggists; teach them a lesson; show them that they have no business to sell something else when his goods are called for.

We were very much amused at the remarks credited to one speaker at this recent conference. He said: "Gentlemen, I went to a druggist the other day. I asked him how, after I had spent my money to send customers to his store for my goods, he dared to sell them something else. At this he turned upon me and said: 'Why do you dare to send people to my store? I never told you to send people to my store. This is my store and I have a right to sell whatever I please, and I don't ask you to send people here for anything.'" "I confess," said the speaker, "that his reply staggered me."

The first cause of the trouble, as we have intimated, was in advertising to the public the retail prices of these goods. This gave the department stores just the bait they wanted to bring people to their establishments. Of course we all know that they used them as baits and expected to make their money on something else with the price of which people were not familiar. This action not only drove the druggist in self-protection to the selling of other goods, but the department stores themselves soon became tired of selling goods at about cost, and they have proven to be the worst substituters of them all. Most of them have rank substitutes for almost every legitimate proprietary medicine, and they offer their clerks extra commissions on all sales of their own preparations. The result is that our friend, the proprietor, who thought he was so fortunate and congratulated himself so heartily upon the department stores pushing the sale of his goods, now finds that very action is proving to be, to a very large extent, the ruination of his business. He cannot depend upon the department store, he has lost the friendship of the druggist, and now, as a request, and in our opinion an erroneous one, he asks the daily press to come forward and educate the people to the fact that they should never take anything but the original.

We will only briefly refer to another phase of this subject, and that is in regard to the druggists' right to sell medicines. It is the rankest nonsense to assume that druggists are not qualified to furnish these ready-made prescriptions. The average druggist knows more about putting up medicines than the average proprietary man. A proprietary business is only one branch of a retail shop on a larger scale, and a very large number of the principal proprietary medicines had their beginnings over the counters of some little retail drug shops. The question is, what can be done to remedy the so-called evil? In our opinion the first requisite is for the proprietors themselves to determine each for himself whether he does or does not want the retail druggists to be the distributers of his goods. *If he does, and is in earnest, we are confident that it can be accomplished.* If he continues to be luke-warm and trust to Providence and his usual good luck, matters will drift on from bad to worse. But if he is really in earnest and wants to keep the distribution of his goods in the recognized legitimate drug channels, he can do it by the simple adoption of a few steadfast rules for the regulation of his business. We make this statement with every confidence in its possibilities, and this opinion is based upon years of observation and study of this problem, combined with an extended drug experience. Just what these rules and regulations are we will not attempt to state here, but shall be glad to explain them to any proprietor who may be interested.

To you editors of the daily press we wish to say, that if you desire to do something to help this work along, because it will be of benefit to your patrons, and indirectly a benefit to yourselves, direct your philanthropic efforts toward educating your readers in the knowledge that the drug store is the proper place to buy medicines. Drug stores are a necessity, and the more we can have of them in the residence districts, the greater convenience to the inhabitants. In times of emergency this convenience is of inestimable value. Say to the people that if they want good drug stores and many of them, they must patronize the stores in their localities. Medicines should not be purchased because they are cheap but because someone is ill, and cheap medicines always excite suspicion. The department store is not an appropriate place to purchase medicines. We are told that John Wanamaker, the recognized prince of merchants, has no drug department in his mammoth establishments in Philadelphia and New York, because he recognizes the great convenience of drug stores in residence portions of cities, and, further, because, as he says, he does not wish to take the responsibility of handling merchandise which may so seriously affect the lives or health of his patrons. This, in our opinion, is a very just and equitable decision on his part. Everything in this world cannot be put upon the 99-cent basis. When our children are sick we want a doctor and we want him quick; we want the medicine without delay and we want it right. Educate your readers to go to the drug stores to buy their medicines; use your influence with the department stores to wipe out their so-called drug departments; treat the druggist in your columns with the consideration to which a man of his education and intelligence is entitled, and stop poking fun at him because he charges a reasonable profit for his time and necessary business expenses.

If the manufacturers will fix the distribution of their goods so that their retail distributing agents can make a reasonable profit, and if the newspapers will use their influence in the directions we have indicated, all this trouble about substitution will soon cease. The majority of druggists prefer to handle goods which have a rapid sale and which they know are always as good as the dollars paid for them. They do not from choice buy goods which are slow sellers and to which they must give their endorsements in order to perfect sales.

Where We Stand.

An esteemed friend writes us as follows:

> "Where does the Era stand on the patent medicine question? There is certainly going to be a war between the retail druggists on one side and the patent medicine men and newspapers on the other. The Era is expected to represent the interests of the retail drug trade. It should come out flat-footed and stand with them."

We are indebted to our correspondent for the opportunity he affords us of stating the Era's position on this timely subject.

In our consideration of this problem we treat it as a purely commercial one. It is not the question whether the world would be better or worse without patent medicines. Other countries have tried by legislation to prevent people from buying and using ready-made medicines, but such efforts have never been successful. The traffic in these goods belongs naturally to the drug trade. The majority of druggists want these sales, and the Era is doing what it can to bring back this business to the druggists, and upon such a basis that they can make a fair profit.

There are millions of dollars' worth of these proprietary goods sold annually, and the Era considers it its duty as an organ of the drug trade to use its influence towards keeping this business within the hands of the wholesale and retail druggists, rather than to see it divided with the grocery trade and general stores. It is not a question of ethics, but dollars. We always feel like lifting our hat when we pass an ideal prescription pharmacy, but these are feasible only in a few localities. It is because the druggists need the dollars they should make on the sales of patent medicines that the Era is trying to redeem this trade for them.

IODOFORMSALOL.—A mixture of equal parts of iodoform and salol used as antiseptic.

PROPOSED PHARMACY LAW FOR GREATER NEW YORK.

As all know, the State of New York is blest with several boards of pharmacy, one each for the counties of New York, Kings and Erie, each virtually exercising supervision over pharmaceutical affairs in the three cities, New York, Brooklyn and Buffalo, and the State Board, whose jurisdiction extends over all of the State except these three sections. All know, too, that the cities of New York and Brooklyn, with a number of outlying towns, are to be joined under one great municipal corporation. This proposed union renders necessary a very thorough revision of the laws and ordinances of all character severally in force in the separate cities, and their unification into a single code of statutes to govern the new Greater New York. A commission specially appointed to draw up a charter for Greater New York has just made its report to the State Legislature, and from a reprint of this very lengthy and comprehensive report, brought out through the enterprise of the Brooklyn Eagle, we are enabled to learn what is proposed for the regulation of pharmacy. Following we give in small type the section which bears upon pharmacists and druggists, with our comments thereon:

REGISTERED PHARMACISTS ONLY TO CONDUCT PHARMACY, EXCEPT, ETC.

Sec. 1,510. It shall be unlawful for any person unless a registered pharmacist within the meaning of this title to open or conduct any pharmacy or store for retailing, dispensing or compounding medicines or poisons in the city of New York, as constituted by this act, except as hereinafter provided; provided that the widow or legal representative of a deceased person who was a registered pharmacist within the meaning of this title may continue the business of such deceased pharmacist, provided that the actual retailing, dispensing or compounding of medicines or poisons be only by a person who is a registered pharmacist within the meaning of this title.

This section is self-explanatory and appears very satisfactory, its most salient feature being the provision that whoever may conduct a drug store, the actual compounding of medicines must be undertaken by no one but a registered pharmacist.

QUALIFICATIONS OF REGISTERED PHARMACISTS.

Sec. 1,511. Any person, in order to be registered, shall be either a graduate in pharmacy or a licentiate in pharmacy or a graduate having a diploma from some legally constituted medical college or society. But a license as a pharmacist granted any person after the examination by any board of pharmacy legally created under the laws of this State shall entitle such person to a license or certificate of registration from the board of pharmacy created by this title, upon presenting to said board his license and complying with the formal requirements of the laws. Any person who, at the time this act takes effect, shall be entitled by law to open or conduct any pharmacy or store for retailing, dispensing or compounding medicines or poisons in any part of the territory included in the city of New York, as constituted by this act, shall be entitled hereafter to open or conduct any such pharmacy or store in said city, and to be registered by the board of pharmacy created by this title.

Intended merely to provide that no one shall be legislated out of business at the time of the act, and to define what shall be the legal qualifications of registered pharmacists.

GRADUATES AND LICENTIATES DEFINED.

Sec. 1,512. Graduates of pharmacy within the meaning of this title shall be those persons who have had at least four years' experience in stores where prescriptions of medical practitioners have been compounded, and who have obtained a diploma from any college of pharmacy within the United States, or from some authorized foreign institution or examining board; and licentiates in pharmacy shall be those persons who have had at least four years' experience in stores where prescriptions of medical practitioners are compounded and who shall have passed an examination either before the board for the examination of and licensing druggists and prescription clerks in the city of New York, as heretofore existing, established by an act passed March 28, 1871, or before the board of pharmacy in the city of New York, as heretofore existing, or before the board of pharmacy of the county of Kings, or before the board of pharmacy created by this title, for the city of New York, as constituted by this act, or such foreign pharmacists as shall present satisfactory credentials or certificates of their competency and qualifications to the said last mentioned board of pharmacy. Junior assistants or apprentices in pharmacy shall not be permitted to prepare physicians' prescriptions until they have become graduates or licentiates in pharmacy.

This section is open to criticism from the fact that the Board of Pharmacy is ordered to accept diplomas from any college of pharmacy—a very dangerous provision indeed. There are colleges of pharmacy and colleges of pharmacy—good, bad and indifferent, and it is most unwise to permit a graduate of either the indifferent or bad to register without showing his fitness by examination. We commend the concluding sentence, however, to the effect that assistants and juniors shall not prepare prescriptions, but we anticipate that there will be a great deal of evasion of the law in this respect. There are not a few assistants in this city who are doing prescription work without let or hindrance, and it is doubtful whether they can be detected and punished under the proposed enactment. If the law should read that this class should be permitted to compound only under the supervision of a fully registered man it would seem a wiser provision, for how is the young man to gain experience in prescription work if he is not allowed to do it? Must he wait until he becomes fully registered by examination, or upon diploma? Here is a problem for the "practical experience" men to solve.

BOARD OF PHARMACY; ELECTION, DUTIES.

Sec. 1,513. The members of the college of pharmacy of the city of New York, shall, on the first Monday of January, 1898, and on the same day every third year thereafter, at a special meeting held for that purpose, elect five competent pharmacists, three of whom shall be graduates of some legally constituted medical college and the remaining two graduates of some legally constituted college of pharmacy of the city of New York, as constituted by this act, and who shall form and be known as the board of pharmacy. The members of this board shall, within thirty days after their election as aforesaid, individually take and subscribe before the clerk of the city of New York, an oath faithfully and impartially to discharge the duties prescribed for them by this title. They shall hold office for the term of three years and until their successors are duly elected and have qualified; and in case of any vacancy, the trustees of the College of Pharmacy shall fill the same from two or more nominees elected at a special meeting of the College of Pharmacy. The said board shall organize for the transaction of business by electing from their own number, for the whole term, a president and secretary. The board shall meet at least once every three months and three members shall constitute a quorum. The duties of the said board shall be to transact all business pertaining to the legal regulation of the practice of pharmacy in the city of New York, and to examine and register pharmacists. Any pharmacist applying for examination shall pay to the secretary a fee of $5, and should he pass such examination satisfactorily he shall be furnished with a certificate as to his competency and qualification, signed by the said board of pharmacy.

This is a section which has already begun to cause much trouble and hard feeling. It is considered as laying entirely too much responsibility upon the New York College of Pharmacy, and according to that institution entirely too much in the way of privilege and advantage. Druggists in Brooklyn are up in arms against this feature, for they claim that their own institution, the Brooklyn College of Pharmacy, is entirely ignored and belittled, and they want to know why the New York College should have it all and they none. We do not think that the exact wording of the measure fully justifies this complaint, for it says that two of the board shall be graduates of "some legally constituted college of the city of New York," and when Brooklyn becomes a part of the city of New York, then its college, if legally constituted, stands just as much chance of representation on the board as the present New York college. But we believe this entire section is most illy considered. We are opposed to any private institution, to any college, possessing such powers as this section would confer. The druggists of not only Brooklyn alone, but all in this city as well are justified in declaiming loudly against it.

BOOKS FOR REGISTRATION OF PHARMACISTS, ETC.

Sec. 1,514. It shall be the duty of the secretary to keep a book of registration at some convenient place, of which due notice shall be given through the public press, in which book shall be entered, under the supervision of the said board, the names and places of business of all persons coming under the provisions of this title. It shall be the duty of all such persons to appear before the said board of pharmacy, and the fee for the registration of pharmacists shall not exceed two dollars, and for assistants shall not exceed one dollar. The secretary shall give receipts for all moneys received by him, and pay over the same to the treasurer of the College of Pharmacy aforesaid, taking his receipt therefor, which moneys shall be used for the purpose of defraying the expenses of the board of pharmacy, and any surplus shall be for the benefit of the College of Pharmacy. The salary of the secretary shall be fixed by the board, and shall be paid out of the registration fees.

The principal point of interest in this section is th matter of the disposition of funds, and it is this poin which has thoroughly aroused druggists in this cit and Brooklyn and has called out their indignant protest Why should the New York College of Pharmacy, or an other college, be made the beneficiary of a tax laid upo a class of men for the privilege of conducting their busi ness? There is no reason or justice in asking the drug gists of Greater New York to contribute their mone for the purpose of buying books for a college of phar macy, or for its benefit in any way. No disposition o this income should be made save in the execution of th law and the prosecution of offenders against it. To di vert it to other purposes, and especially in the manne proposed, is entirely unjustifiable.

PHARMACISTS RESPONSIBLE FOR QUALITY OF DRUGS, ETC., SOLD; PATENT MEDICINES, ADULTERATION, ETC.

Sec. 1,515. Every registered pharmacist shall be held responsible for the quality of all drugs, chemicals and medicines he may sell or dispense, with the exception of those sold in the original packages of the manufacturer, and also those known as "patent medicines," and should he knowingly, intentionally and fraudulently adulterate, or cause to be adulterated, such drugs, chemicals or medical preparations, he shall be deemed guilty of a misdemeanor, and upon conviction thereof, be liable to a penalty not exceeding one hundred dollars and in addition thereto, his name shall be stricken from the register.

POISONS; RETAILING OF.

Sec. 1,516. It shall be unlawful for any person to retail any poisons enumerated in Schedules A and B, as follows, to wit:

SCHEDULE A.

Arsenic and its preparations, corrosive sublimate, white precipitate, red precipitate, biniodide of mercury, cyanide of potassium, hydrocyanic acid, strychnia and all other poisonous vegetable alkaloids and their salts, essential oil of bitter almonds, opium and its preparations, except paregoric and other preparations of opium containing less than two grains to the ounce.

SCHEDULE B.

Aconite, belladonna, colchicum, conium, nux vomica, henbane, savin, ergot, cottonroot, cantharides, creosote, digitalis and their pharmaceutical preparations, croton oil, chloroform, chloral hydrate, sulphate of zinc, mineral acids, carbolic acid and oxalic acid, without distinctly labeling the bottle, box, vessel or paper in which the said poison is contained, and also the outside wrapper or cover with the name of the article, the word "Poison," and the name and place of the seller; nor shall it be lawful for any person to sell or deliver any poisons enumerated in Schedules A and B, unless upon due inquiry it be found that the purchaser is aware of its poisonous character, and he represents that it is to be used for legitimate purpose. Nor shall it be lawful for any registered pharmacist to sell any poisons included in Schedule A, without, before delivering the same to the purchaser, causing an entry to be made in a book kept for that purpose, stating the date of sale, the name and address of the purchaser, the name and quality of the poison sold, the purpose for

> which it is represented by the purchaser to be required, and the name of the dispenser; such book to be always open for inspection by the proper authorities, and to be preserved for reference for at least five years. The provisions of this section shall not apply to the dispensing of poisons, in not unusual quantities or doses, upon the prescriptions of practitioners of medicine.

May pass without special comment, though there will be many who will pick flaws in them.

APPLICATION OF PRECEDING SECTIONS TO PRACTITIONERS OF MEDICINE AND WHOLESALE DEALERS.

> Sec. 1,517. Nothing contained in the foregoing sections of this title shall apply to or interfere with the business of any practitioner of medicine who does not keep open shop for the retailing of medicines and poisons, nor with the business of wholesale dealers, but the preceding section, and the penalties for its violation, shall apply to such persons.

FRAUDULENT REGISTRATION, PERMITTING UNLICENSED PERSON TO COMPOUND MEDICINES.

> Sec. 1,518. Any person who shall attempt to procure registration for himself, or for any other person, under this title, by making or causing to be made any false representation, shall be deemed guilty of a misdemeanor, and shall, upon conviction thereof, be liable to a penalty not exceeding five hundred dollars. Any registered pharmacist who shall permit the compounding and dispensing of prescriptions of medical practitioners in his store or place of business, by any person or persons not registered, or any person not registered who shall keep open shop for the retailing or dispensing of medicines and poisons, or who shall fraudulently represent himself to be registered, or any registered pharmacist or dealer in medicines who shall fail to comply with the regulations and provisions of this title, in relation to the retailing and dispensing of poisons, shall, for every such offense, be deemed guilty of a misdemeanor, and upon conviction thereof, be liable to a penalty of fifty dollars.

PENALTIES TO BE PAID TO COLLEGE OF PHARMACY.

> Sec. 1,519. Each and every penalty recovered under this title shall be paid to the trustees of the College of Pharmacy, and shall form and be known as the library fund of said College of Pharmacy, and shall be expended for the purchase of books for the library of said college.

BOARDS OF PHARMACY ABOLISHED.

> Sec. 1,520. The board of pharmacy of the county of Kings and the board of pharmacy of the city of New York as heretofore existing, are both hereby abolished.

In considering this whole matter, two or three points of importance are presented. This pharmacy portion of the proposed charter for Greater New York simply continues objectionable conditions which are prevailing today, and certainly affords valid cause for a demand for better legislation in pharmacy in this State. We believe it an unwise thing to have several boards now working within the confines of one State, and would urge unification of these into one State Board of such a size and character as to adjudicate successfully the pharmaceutical affairs of the entire State. The selection of members of this board should not be left to any individual interests or private institutions, but should represent the balance of sentiment and desire of the entire pharmaceutical fraternity. The rule followed in some other States, that of the State Pharmaceutical Association selecting a number of candidates from whom the Governor shall appoint the members of the board, works very satisfactorily, as a rule (though they are having some trouble over this matter in Minnesota, however, where the Governor saw fit to be a law unto himself). Then all fees and income should be applied to pay the expenses of the board and for the enforcement of the law, and any surplus whatsoever should be paid into the State treasury, and not diverted to an illegitimate use. We think the Greater New York pharmacy proposition under criticism is a poorly devised one, weakly framed, and with hardly an element of soundness or substantiality about it. It provides that over half the members of the board shall be physicians. Perhaps this is something in the way of a sop to political and professional interests, due to influence brought to bear upon the framers of the charter, but why should doctors hold the majority power in the execution of a law affecting pharmacy alone? We might just as well ask that pharmacists constitute medical examining boards, etc. On this matter we have spoken right out in meeting, expressing our own views. We are opposed to the law in question, and believe we have in this position the support of the majority of pharmacists in these two great cities, New York and Brooklyn. We have no quarrel with the college of pharmacy of either city, but we do not wish to see either of them placed in a position of such power and influence, particularly when there can, in our opinion, be advanced no justification thereof. Perhaps the college of pharmacy needs a library, but if so it can be gotten in a more dignified manner than by this compulsory tax upon men for the privilege of carrying on their business. But we do need better pharmacy legislation in this State, and we hope that the efforts put forth by the State Association, by the German Apothecaries' Association of New York, and by other associations and institutions will be successful in bringing order out of the present chaos and securing uniformity.

Our New Trade Department.

With this issue of the Era we "inaugurate" our new Trade Department, which promises to be of special value to the drug buyers.

Besides our Trade Reports, Market Reviews and Prices Current, all of which will be materially improved as we progress in the work, we shall add to this department such information as is of direct value to the druggist in his purchasing department. The special announcements of the large houses will be of particular value to every druggist. These representative firms have something of interest to say to the drug trade every week. They will change their copy weekly, and we anticipate that these weekly announcements will add materially to the interest and value of this department. "Goods well bought are half sold," and no druggist who expects to be successful in the management of his business can afford to deny himself every reliable source for information in the purchasing of his goods.

An Argument for Free Alcohol.

A wide-awake, hard-headed, business druggist writes, "I favor free alcohol *even if it cannot be made free to the retail druggist* I look for a reduction in prices of many alkaloids and fluid extracts. If we had an established price for our prescriptions, as in some countries in Europe where it is based on a percentage above average wholesale price, I should be against it, but under the circumstances here we could reduce the price on prescriptions materially without at the same time reducing our total net income."

This druggist is not actuated by the dog-in-the-manger policy of "if I can't have it, I don't want anyone to be benefitted," but is willing to take his chances, so long as the majority want this most important boon. If the retail drug trade were against free alcohol, which it isn't, it would not alter the fact that we should have it for the benefit and advancement of this great country of ours, with its vast industries needing tax free alcohol for their progress and development.

YIELD OF PLATINUM IN RUSSIA.—Russia mines 40 times as much platinum ore as the remainder of the mines throughout the world taken together. In 1890 2,946 kilos were yielded, in 1895 4,413 kilos, in 1894 the yield dropped considerably behind the average because of the wet summer. The source is entirely from the southern districts of the Ural, from where the crude material is sent to Germany for working up. The crude metal sold in 1896 for 900 marks the kilo. The last year's yield of iridium was only 4.1 kilos.

Samuel G. McCotter.

Forty years' experience in the drug trade of New York gives Samuel G. McCotter, drug broker, an unquestioned pre-eminence. His friends say that his recollections of business men and business methods before the war are extremely interesting, but Mr. McCotter is a man of few words and seldom descends to anecdote. He was born August 3, 1841, in New York City and was employed with B. A. Fahnestock, Hull & Company, at 51 Cliff street, from 1857 to 1865. At the latter date he formed a partnership with Reuben Daniell, and they carried on a brokerage business under the name of Daniell & McCotter for say 12 years, when Mr. McCotter began business by himself. The drug business must be a comparatively healthy one because nearly all Mr. McCotter's early associates are still hale and hearty. Aurelius B. Hull, the New York partner in Fahnestock, Hull & Company, is living in Morristown, N. J., W. B. Stafford, their principal salesman, resides in New York. Charles D. Deshler, their cashier, lives in New Brunswick, N. J., where he is a respected lay judge. Mr. Daniell, Mr. McCotter's former partner, is eighty-three years old and occasionally comes over to the office from his home in Brooklyn.

Those were halcyon days for the drug trade forty years ago. Retail dealers used to get six months time on goods and 5 per cent. off for cash. Not infrequently twelve months time was given. It was customary to make purchases twice a year, and the customer had to stand the expense of a trip to New York, for there were no travelling salesmen. Happy was the retailer who enjoyed the favor of the jobber in those days. During the busy season the wholesaler actually felt that he was doing a favor to sell his goods at any price.

"I'll take your order and begin filling it in eight days," was a familiar ultimatum.

Mr. McCotter tells how the partner of the Pittsburg house of B. A. Fahnestock & Co. used to deal with his customers.

"Do you expect to secure prices elsewhere before ordering?" he would ask.

"Yes."

"Very sorry, but in that case we cannot quote you our prices," he would reply, and dismiss the culprit.

Brokers doing an out-of-town business before the war charged buyers as well as sellers 1 per cent.

Mr. McCotter does not regard the drug brokerage business as a good field for a young man to go into at the present time. He says that the great manufactories have revolutionized the drug business with their package goods and have absorbed most of the profits formerly distributed. Mr. McCotter is, however, no pessimist. He believes the public were never better served as to purity of drugs and lowness of prices than now.

At the request of the Era Mr. McCotter jotted down all the leading ante-bellum drug houses which were familiar to him, and as the record may awaken pleasant recollections for many of the old-timers it is reproduced here. As Mr. McCotter says, there have been great changes since then, and New York City has lost ground. Here is the list:

Jobbers in the United States: Charless Blow & Co., St. Louis; J. H. Reed & Co., Chicago—(J. H. Reed is alive and resides in Orange, N. J.); T. & J. Hinchman, Detroit, Mich.; Craighead & Browning—(afterwards Robert Browning), Indianapolis; Robert Hockenhull, Jacksonville, Ill.; Schieffelin Brothers & Co.; M. Ward & Co.—(afterwards M. Ward, Close & Co.); Olcott, McKesson & Robbins—(afterwards McKesson & Robbins); Harral, Risley & Kitchen; C. V. Clickener & Co.; Barnes & Park—(patent medicines); Lazell, Marsh & Hunn; Stebbins, Morgan & Butler; Hall & Van Buskirk—(afterwards Hall & Ruckel); D. T. Lanman & Co.; J. H. Hazard & Co.; Palanca & Escalante; Richardson, Mellier & Co., St. Louis; Reed & Cutter, Boston; French, Richards & Co., Philadelphia; Wheelock, Finlay & Co., New Orleans; Ben. Hardaway, Vicksburg; Purcell, Ladd & Co., Richmond; R. A. Robinson & Co., Louisville; Wilson, Peter & Co., Louisville; Lyman Brothers & Co., Montreal; Lyman, Elliot & Co., Toronto; John L. Thompson & Co., Troy; W. F. Phillips & Co., Portland, Me.; J. B. Dougherty, Muscatine, Ia.; Mansfield & Higbie, Memphis; Greene & Button Co., Milwaukee; J. & C. Reakirt, Cincinnati; J. & S. Burdsal, Cincinnati.

Importers: George N. Lawrence, Fisher & Keller, F. Consinery & Co., D. A. Van Lennep, Dutilh & Co., B. Blanco.

Brokers: McCorkle, Downer & Orne; George P. Edgar; A. W. Despard; Parsons & Pettit; Wing & Evans; S. F. Wetenhall & Co.; Degen & Taft.

Though Mr. McCotter's memory goes back a long way, he is by no means an old man, and his business friends find him very active. The office of S. G. McCotter & Company is at 68 Maiden Lane, and is unostentatious, neat and old fashioned. Mr. McCotter resides with his family in Brooklyn.

THE WORLD'S FOOD.—The following statistics prove very conclusively that bread does not after all play any important part in the world's board bill.

The inhabitants of Europe alone consume over 6.470,000 tons of meat per year. Paris slaughtered 11,862 horses last year for consumption. During the same time the United States exported to Europe 514,000,000 pounds of bacon, 84,000,000 pounds of hams and 81,000,000 pounds of pork. To each European 61 pounds of meat may be measured for his yearly consumption, to this may be added 29 pounds of sugar.

Last year England imported 3,556,000,000 pounds of foreign sugar aside from the products of its colonies. Yearly 4,439,000,000 oysters are consumed. The Paris restaurants require 2,000 tons of snails, 18,000 dozen of frogs and 5,000 tons of radishes each year to coax the appetites of their guests.

Italy exports yearly 480,000,000 dozens of eggs, 2,500,000,000 oranges. America sends 95,000 tons of apples to England.

Of all the European nations the Englishman heads the list on the consumption of salt, being 40 pounds per capita while the American follows with 39 pounds. To the Dane a yearly consumption of 22 pounds of cheese is charged.

A statistician claims that each individual during his lifetime consumes unnecessarily seven four-horse wagon loads of food!

(Specially Contributed.)

RECOLLECTIONS OF AN OLD-TIME DRUG CLERK.

By CHAS. D. DESHLER, New Brunswick, N. J.

(Continued from page 233, Feb. 25.)

The head clerk, Boyer, to whom I have alluded in connection with the above incident, came legitimately by his predilection for the drug business. His full name was Robert Eastburn Boyer, and he was a nephew of the late Thomas Eastburn, who carried on the drug business for many years, on Church street, midway between Peace and Dennis streets. He was also a grandson of the old ante-revolutionary New Brunswick druggist, Robert Eastburn. He began his novitiate with his uncle Thomas, but, realizing the low scale of pharmaceutical knowledge that was attainable there, soon sought a larger field with higher possibilities. He went to New York some time in the twenties, and, after many discouragements, succeeded in getting employment as a boy of all work with William L. Rushton, then the most famous dispensing apothecary in the city, and, perhaps, in the country. Here he remained some years, attracting the attention of Mr. Rushton by his diligence, deftness and probity, and acquiring by gradual advancements a complete knowledge of the business in all its branches, till he finally rose to be chief of the prescription department, in which branch he became an adept. He continued with Mr. Rushton until he was invited to become the head clerk of the New Brunswick establishment, at which I made my first appearance several years later, and in which he ultimately became a partner, as I also did after his death. Boyer was an enthusiastic lover and a thorough master of the business. He understood as much of chemistry as was practically needful; and had the "materia medica" at his tongue's end, so far as related to an accurate knowledge of the properties, therapeutic uses, doses and qualities of medicines, or the manufacture of all the officinal preparations which were then in use. All these he had memorized from long practice, so that he could prepare almost all of them without reference to the dispensatory, if it became necessary. He was, without exception, the neatest, most expeditious, and most expert pharmacist I have ever seen. The manner in which he filled a phial, or made a pill, or compounded a prescription, or put up a powder or folded a parcel, was the perfection of rapidity, ease and skill. It was a treat to see him fold a bundle, whether large or small, and when it left his hands it was a model of symmetry and beauty. The same observation holds with regard to his manipulation generally; it was not merely perfect; it excited emulation and admiration. He was as strictly methodical as he was skillful and scrupulously accurate. Everything must be done, as he did it, decently and in order, and with religious care and exactitude. Everything must have a place, and must be put in its place. He exacted the utmost cleanliness and neatness, even in trifles. Medicines that were in frequent demand were so disposed by him that by no reasonable possibility could those which were noxious be dispensed by mistake for those which were innocuous. Poisons were so placed that some obstacle always interposed against their thoughtless or inconsiderate handling—either they were put so high that steps were required to reach them, or they were placed behind other articles which must first be removed before they could be reached. While medicines were being compounded or dispensed he permitted no levity, discouraged conversation, and required the most absolute attention to be given to the matter in hand. He felt, and he inspired his juniors to feel, that when he was thus engaged he was exercising a grave trust which involved not only health, but, possibly, life or death. He was one of the most conscientious of men, and this feature of his character extended to the minutest of his dealings as an apothecary. He gave and he exacted full weight and measure. He tolerated no sophistication of medicines, however trivial they might be. Whatever medicine he sold would produce the desired result, so far as related to its own powers and properties. He hated lies and dissimulation, whether acted or spoken, and was accustomed to say that the apothecary who knowingly sold a tincture, preparation, or drug, which was below the standard in strength or quality, was a liar and a cheat, and might become a homicide.

Boyer was the first one to bring to the drug business in New Brunswick a thorough equipment for the pharmaceutical department. Before his return to our city from New York, our druggists rarely, if ever, compounded physicians' prescriptions, for the reason, primarily, that our physicians then kept their own medical supplies and prepared their own preparations and prescriptions. I do not believe that a single prescription, properly so called, had ever been put up in any drug store in New Brunswick earlier than 1833, and even then, and for many years later, they were of exceedingly rare occurrence. The dispensing of medicines at all in the nature of prescriptions was almost exclusively confined to the preparation of some special recipes for their owners, or the administration, as they were called for, of doses of calomel and jalap, rhubarb and magnesia, tartar emetic, Dover's powders, quinine, castor oil, purgative pills, cholera mixtures, and a few other articles.

In 1832, and for some years later, there were comparatively few patent or proprietary medicines of American origin—the principal ones among them being Swaim's Panacea, Swaim's Vermifuge, Lee's Anti-Bilious Pills, Thompson's Eye Water, Thompson's Itch Ointment, Ditchett's Pile Remedy, and Miles' Tomato Pills. There were, however, a goodly number which were of trans-atlantic origin, the formulas for which were given in all the dispensatories of the day, and which were manufactured and put up by our druggists enclosed in descriptive wrappers with directions for further use, which were bought by the quire or ream ready printed. In all these descriptions the antiquated type and spelling and the old-time quaint and ornate phraseology were preserved, some of them having been prefaced with such swelling words as these: "Medicamentum gratia probatum est;" or, "This is a capital of great antiquity and established reputation;" or, "Elixir of health and universal catholicon," etc., etc. Among the most popular of these proprietary articles of pretended English manufacture were the following: Steer's hard and liquid opodeldoc, Bateman's Drops, Hill's Balsam of Honey, Ching's Worm Lozenges, Betton's British Oil, Harlaem Oil, Elixir Proprietatis, Godfrey's Cordial, Dalby's Carminative, Daffy's Elixir, James' Fever Powders, Hooper's Female Pills, Anderson's Scotch Pills, and Turlington's Balsam. The last named was also variously known as Friar's Balsam, Vervain's Balsam, Traumatic Balsam, Commander's Balsam, Jesuit Drops, Wade's Drops and Compound Tincture of Benzoin.

In those days the herb and root closet formed a most important adjunct of every well-equipped drug store. Among the simples which it contained were specifics, which in the popular belief were remedies, severally, for nearly all the "ills that flesh is heir to." Such of them as were the most largely in popular use were these: Mint, boneset, horehound, catnip, balm, saffron, sage, pink-root, snake-root, blood root, stramonium, foxglove, sweet fern, mandrake, wormwood, wormseed, blessed thistle (Carduus benedictus); so called because tradition declared it to be the species with which the Savior was crowned by his crucifiers), hemp-root, motherwort, lovage, liverwort, calamus, elecampane, comfrey, dill seed, marshmallow root, bayberry bark, sumach berries, black cherry bark, white oak bark, celandine, hyssop, pellitory, yellow dock root, dandelion root, feverfew, mezereon bark, spikenard, sassafras, pennyroyal, rosemary, rue, elder flowers, thyme, Solomon's seal, life everlasting, tansy, coltsfoot, etc., etc. Blood root was a specialty with the negroes, who called it, according as its fracture was salmon colored or dark red, "Queen" root and "King" root, or "she" and "he" root. They believed it to be rooty, or, in other words, to have the power to avert the spells wrought by other unfriendly negroes through the agency of their malign fetich, Oby (Obeah), and also to exert a fascinating or propitiatory influence over the other sex. Catnip was the orthodox remedy for colic in babies, as mint and pennyroyal were for the same enterprising complaint in adults. Sweet fern was a cure for pimples, wormseed (sprinkled on bread and butter) for worms, boneset for rheumatic fevers, horehound for coughs and colds, liverwort for pulmonary and hepatic affections, saffron for scarlet fever and measles, digitalis for asthma, celandine for warts, pink-root for worms, pellitory for toothache, sumach berries for sore throat and scarlatina, blackberry bark and root for diarrhœa, and blessed thistle for all imaginable and most imaginary diseases.

The nostrum department, consisting of empirical preparations that were regularly kept in stock and dispensed in response to popular calls from the ruder and more ignorant classes, and which belonged entirely outside the list of proprietary medicines, was a considerable one. To this department belonged the following: Oil of tar, oil of stone, oil of spike, seneka oil (crude petroleum), oil of earthworms, frog-spawn water, aqua mirabilis (compounded of cloves, cardamoms, cubebs, mace, ginger, cinnamon, citron peel, balm and brandy), balsam of sulphur, skunk's grease, dog-fat, goose grease, dried snails, prepared wood lice or millipedes, compound powder of millipedes, egyptiacum, and many others equally as crude.

For the information and amusement of modern pharmacists I recall some of the vulgar and popular appellatives that were often coupled with the articles sold by the old-time druggists, and with which they were as familiar as they were with their correct names. These dialect vulgarisms of home manufacture may not be devoid of interest to the philologist. Thus: Allspice was called Jamaica pepper; cloves, pepper-nails; powdered hellebore root, sneezing snuff; oil of origanum, oil of regnum, and king of oil; roll sulphur, brimstone, cane brimstone and hell-timber; stramonium, stink-weed, Jamestown weed and Jimson weed; lobelia, Indian tobacco; quicksilver ointment, blue ointment and anguintum; gum tragacanth, gum dragon; cocculus indicus, Indian berries, fish berries and coco-a-nanny berries; peruvian bark, jesuit's bark and jesuit's powder; turpentine, terps; glauber salt, horse salts; annatto, aranetta, anter and yaller anter; feverfew, featherfew; quinine, quin-ans and Queen Anne; prepared chalk, crab's eyes; sweet spirit of nitre, fever drops; oxide of tin, polishing putty; nicaragua wood, nigger-auger wood; carbonate of ammonia, hartshorn and sal volatile; mandrake root, mandragora, and, from its resemblance to the human form, old-man-in-the-ground; and, finally, asafœtida, which was variously known as tuyvel's trayck, devil's dung and assafarty. The last was the expressive Hibernian term for the fragrant drug. All the variations of its name seem to have been more or less remotely suggested by the Turkish legend, that on the spot where Satan set his foot when he stole into Paradise, the asafœtida plant sprung up for the first in the world.

It will not be altogether inappropriate at this point to recall a few particulars as to the popular practices and beliefs of some of those who patronized the old-time druggists. Thus: The use of opium was very prevalent, but as furtive as it was prevalent. The rich bought it by the ounce and even by the pound—the price at that time being 3 shillings or 37½ cents an ounce, and $5 a pound. The poor bought it by the eighth, quarter, or half-ounce. To the former it was a dreamy, benumbing and destructive intoxicant, and to the latter it afforded the temporary refuge of forgetfulness. It was easy to detect the regular opium eater by the peculiar puffiness of the face and the semi-opaque yellowness of the complexion. Many of those who were regular opium eaters were also inveterate consumers of Scotch snuff, which they bought by the ounce, pound or bladder, according to their means, and with which, by the aid of their fingers or of a stick padded with cloth at one end, they rubbed their gums and teeth in a supremely disgusting way. It was a popular belief that common black pitch, or burgundy pitch, if chewed, averted consumption, cured shortness of breath, and also sweetened the breath and preserved the teeth, and, consequently, many persons chewed both as assiduously as some young people nowadays, with much less basis of reason, chew chewing-gum. Another popular belief attributed the cure of rheumatism to roll sulphur worn in the pocket. It was usually worn loose in pieces from two to three inches long, and was replaced every fortnight by a fresh piece—the idea being that its virtues had all been absorbed by the patient, or that it had become so saturated with the virus of his disease as to be useless. A like belief extended to horse-chestnuts, and to cubes of raw turnip or horse radish, which were similarly worn and changed for the same disease. The white streaks which are found in the excrement of fowls supplied another popular remedy. This was carefully scraped away from the attendant dark colored excrement; after which it was dried by exposure to the sun or fire, and was then used as a sternutatory, or applied to old sores or ulcers as an escharotic. Cobweb was also largely used as a styptic, for which it was quite convenient in slight cases; and it was rolled into pellets and taken internally for fever and ague. To asafœtida were attributed many virtues, alike for man and beast. Worn in a little bag next the flesh on the bosom, it was credited with being a sovereign remedy for convulsions and whooping-cough in young children, and as a preventive of fever and ague in adults. Wrapped in cloth and plugged into a hole that had been bored in the manger, or tied to the bit, it was thought to give horses that were "off their feed" an appetite, and also credited with giving them a smooth coat. It certainly was greatly liked by horses, as they evinced by licking with great assiduity around the hole in which it had been deposited. It was a great favorite also with negro anglers, who used it liberally sprinkled on their bait, and declared that it made fish, especially eels, bite with great avidity. This list might be largely extended.

The implements and apparatuses of the apothecary department of the druggists of the period of which I am speaking, now deserve to be considered, for they will throw considerable light on the stage of advancement and progress which he and his compeers had reached. It goes without saying that there were scales and weights, handsome polished brass beam scales and weights for articles weighing from a quarter of an ounce to a pound or so avoirdupois, and a small apothecaries' scale suitable for weights ranging from an eighth of a grain to a dram. And there were a minim glass, and graduated glasses of various sizes; small porcelain mortars for acids and corrosives; wedgwood-ware filtering funnels and mortars of various sizes; marble mortars whose capacity varied from half a gallon to two gallons, and having wooden pestles; iron mortars from the capacity of a pint to two gallons; a set of porcelain pill slabs and a pill machine; several broad wooden spatulas for rolling out pills, and steel spatulas of every size; alcohol lamps and stands equipped with pint, quart and half-gallon boilers; plaster kettles, syrup kettles, copper boilers for preparing opodeldoc, and earthern vessels for the preparation of ointments and cerates; glass retorts and receivers of several sizes; metallic forms suitable for packing one-ounce, four-ounce and eighth-ounce parcels of epsom salt and other articles which were in brisk demand; wooden spoons or ladles graduated to the proper size for soda and seidlitz powders; a water bath, a sand bath, and a vapor bath; porcelain capsules or evaporating dishes of various sizes; several sets of hair and wire sieves, and a drum sieve; a set of common wine measures; mills suitable for grinding cloves, cinnamon and other spices, and for the coarser roots and barks—together with all the more common and petty implements, which need not be particularized.

(To be continued.)

(Continued from page 235 Feb. 25, 1896.)

*LIST OF REACTIONS AND REAGENTS ACCORDING TO NAMES OF AUTHORS.**

MERZ'S—Olive Oil Test.—Two samples are taken and one heated to 250° C. If the oil is pure the heated sample will have a paler color than the one which has not been heated.

MESNARD'S—Reagent for Albuminoids.—Glycerin containing sugar, and vapors of concentrated hydrochloric acid.

MESSINGER'S—Test for Acetone.—Liquids containing acetone when treated with iodine and sodium hydrate give iodoform. For quantitative estimation the formed iodoform is weighed (Kraemer), or the undecomposed excess of iodine titrated (Messinger).

MEYER'S—Thiophen Test.—Thiophen with its homologues give a blue color with a solution of isotin in concentrated sulphuric acid.

MEYER'S—Test for Cod Liver Oil.—Genuine oil, when shaken with 1-10 of its volume of nitro-sulphuric acid (1 : 1) gives first a rose then lemon yellow color. Other oils of like character do not give as clean colors, or they are brown to violet.

MEZGER'S—Cocaine Test.—An aqueous solution of cocaine, when acidulated with hydrochloric acid, gives an orange yellow precipitate with potassium chlorate.

MILLIAN'S—Test for Linseed in Olive Oil.—Forty grams olive oil are mixed with 60 grams of a 20 per cent. solution of potassium hydrate in 70 per cent. alcohol and heated on a water bath until the alcohol has been entirely dissipated. The resulting soap is dissolved in warm water; and the fatty acids precipitated by the addition of dilute hydrochloric acid. The fatty acids are filtered off and dissolved in 20 cc. of alcohol (90 per cent.) and 2 cc. of a 3 per cent. alcoholic solution of silver nitrate added. When heated to 90° C., a brown coloration ensues, if linseed oil is present.

MILLIAN'S—Modification of Bechi's Test.—See Bechi's Test.

MILLON'S—Test for Albuminoids and Phenols.—A solution of mercury in its own weight of fuming nitric acid (sp. gr. 1.4) prepared by first shaking cold, then moderately warming, after which the solution is diluted with 2 volumes of water. The reagent contains mercurous and mercuric nitrates with free nitric and nitrous acids. Albuminoids when warmed with this reagent give a brick-red precipitate. Likewise the same reaction takes place with all aromatic bodies, which contain a hydroxyl or methoxyl group. The presence of a second hydroxyl or a nitro-group alters the reaction. Thus resorcin gives a yellow color, hydroquinone an orange, pyrogallol a brown, tannin and guaiacol a red, eugenol and vanillin a violet.

Kintschgen-Gintl's modification of this reagent is a solution of mercuric nitrate to which some potassium nitrite has been added, followed, just before using, by the necessary quantity of nitric acid. The potassium nitrite must be free from carbonate, obtained by passing nitrous oxide through its solution. (Compare Gallois', Hoffmann's and Plugge's Reagents.

MILLON'S—Reagent for Salicylic Acid.—A 10 per cent. solution of mercuric nitrate in dilute nitric acid: This gives an intense red color with salicylic acid.

MITSCHERLICH'S—Test for Phosphorus.—This depends upon the phosphorescence produced when phosphorus is heated in presence of steam.

MOHR'S—Test for Free Acids.—This is a mixture of 20 cc. of a 10 per cent. potassium sulfocyanide solution and 5 cc. of a 5 per cent. ferric acetate solution. Hydrochloric acid gives a cherry red; excess of the same produces a chestnut brown color.

MOHR'S—Test for Glucose.—See Moore's Test.

MOLISH'S—Test for Carbohydrates.—One-half to 1 cc. of the solution to be tested is shaken with 2 drops of a 15 to 20 per cent. alcoholic solution of alpha-naphthol or thymol. On adding an equal volume of concentrated sulphuric acid to the above fluid a violet color is produced, if carbohydrates are present; on the addition of alcohol, ether or potassium hydrate, the color dissolves to a yellow.

MOORE'S—Test for Glucose.—On heating glucose or urine containing grape sugar with potassium hydrate a brown color is produced; when the fluid is supersaturated with an acid, a caramel-like odor is given off. Sometimes called Mohr's or Pelouze's test.

MUELLER'S—Test for Cystin.—Cystin separated from the urine sediment is dissolved in warm potassium hydrate solution, diluted with water and sodium nitroprusside added, when a purple color appears.

MUELLER'S—Hardening Fluid.—A solution of 20 grams potassium bichromate and 10 grams of sodium sulphate in 1 liter of water. Used for hardening microscopical preparations.

MULDER'S—Test for Glucose.—The sample of urine to be tested (or glucose solution) is heated with indigo-sulphuric acid and then carefully neutralized with sodium carbonate; in consequence of the reduction of the indigo, various colors are produced, as green, red into yellow. Through influence of air the solution again becomes blue. According to Vogl, litmus solution may be taken in place of indigo. Neumann-Wender employs methylene blue solution.

MULDER'S—Xanthoprotein Reaction.—When albuminoid bodies are boiled with concentrated nitric acid, they are either partly or entirely dissolved, forming a lemon yellow color. Albumoses and peptones give a yellow color in cold solution; on supersaturating with ammonia or alkalies, the color changes to an orange.

MUSCULUS—Urea Reagent.—Fermented urine is filtered, the filter washed and colored with curcuma solution. This is used as a reagent paper. This paper when dipped into a solution of urea is turned brown.

NEELSEN'S—Phenol-fuchsine Solution.—Used to identify tuberculous bacilli in sputum. An aqueous (5 per cent.) solution of phenol (100 grams) is saturated with an alcoholic solution of fuchsine (1 gram fuchsine and 10 grams alcohol).

NESSLER'S—Test for Aldehydes.—Aldehydes give a brownish-black precipitate with Nessler's ammonia reagent or a solution of potassio-mercuric iodide and barium hydrate. This precipitate is soluble in potassium cyanide solution.

NESSLER'S—Test for Ammonia.—An alkaline solution of potassio-mercuric iodide gives with free or combined ammonia a yellow to reddish-brown coloration or precipitate. The solution is prepared by dissolving 50 grams of potassium iodide in 50 cc. of hot water. Then a hot solution of mercuric chloride is added (20 to 25 grams $HgCl_2$), until the precipitate formed is no longer dissolved. After filtering, a solution of 150 grams of potassium hydrate in 300 cc. of water is added, and then diluted to 1 liter. To this 5 cc. of the mercuric chloride is added, and the whole allowed to stand and settle, after which the clear, supernatant fluid is decanted off.

NESSLER'S—Reagent for Wine Colors.—A solution of 7 parts of alum and 10 parts of sodium acetate in 100 parts of water.

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*From compilations of Dr. Altschul (Phar. Centralhalle).

NEUBAUER'S—Test for Biliary Acids.—A modification of Pettenkofer's test. To a few drops of urine which have been evaporated on a water bath, a drop of sugar solution (1 : 500) and a drop of concentrated sulphuric acid are added and warmed. In presence of biliary acids a violet-red color is produced on the sides of the vessel.

NEUBAUER'S—Test for Chloroform in Urine.—A stream of air is passed through the urine. This is then carried through a porcelain tube heated to redness and finally through a solution of silver nitrate. If chloroform is present in the urine, a precipitate of silver chloride is produced.

NEUMANN-WENDER'S — Alkaloidal Reagent.—A solution of 5 drops of furfurol in 10 cc. of concentrated sulphuric acid. (Compare Weppen's Veratrine Test.)

NEUMANN-WENDER'S—Test for Glucose.—To 1 cc. of the diluted (10 x) urine, 1 cc. of methylene blue solution (1 : 1,000) and 1 cc. of normal alkali hydrate solution are added, followed by 2 cc. of water. The mixture is boiled a minute. Should sugar be present the solution will become decolorized.

NICKEL'S—Test for Mineral Acids in Presence of Organic Acids.—This depends on the observation that wood is colored by phloroglucin only when inorganic acids are present. A shaving of pine wood is colored when dipped, for example, in acetic acid, which contains 0.5 per cent. of hydrochloric acid, followed by phloroglucin, and the solution boiled.

NICKEL'S—Color Reaction for Carbon Compounds.—Compare Zeitschr. anal. Chemie, 1889, 244.

NIVIERE AND HUBERT'S—Test for Fluorine in Wine.—The fluorine present in the wine is precipitated by adding calcium chloride to the sample which has been made feebly alkaline with ammonium carbonate. The ashed precipitate is heated with silica and sulphuric acid, whereby silicum fluoride is formed.

NOLL'S—Reagent.—A solution of sodium hypochlorite.

NYLANDER'S—Glucose Test Solution.—Bismuth-subnitrate 2 grams, Rochelle salt 4 grams, are dissolved in 100 grams of an 8 per cent. solution of sodium hydrate. To 10 cc. of the sample of urine, 1 cc. of the reagent is added and then boiled. Presence of glucose causes a blackening of the solution from the reduction of the bismuth. (Sometimes called Almen's Solution.)

(To be continued.)

ENGLISH PHARMACEUTICAL AFFAIRS.

London, Feb. 14, 1897.—Business has been fairly good throughout the country during the first few weeks of 1897, and with the exception of sugar the markets have not called for much comment, but competition is as keen as ever, and the rivalry of imported and home manufactured goods is, if anything, closer than ever. But competition rouses men, and from several recent indications English manufacturers seem to have, at last, awakened to the fact that it is necessary they should do something to maintain their supremacy in commerce. Among other means, the establishment of

Research Laboratories

is one whereby the trade of the coming century ought to benefit, and it shows that manufacturers are wide awake to the necessity of obtaining scientific knowledge and advice on matters which will either cheapen the cost of labor or improve the products.

There were several laboratories in which research was carried on, in existence when the Pharmaceutical Society first started theirs some years since, but of late several have been opened, which ought to be of great service eventually.

The laboratory at the Imperial Institute, which is under the direction of Mr. Wyndham R. Dunstan, F. R. S., is more or less State supported, and the workers are all paid something for their services, and there have been some grants made to it by the City Companies; the work to be carried on there is intended to be of national importance, and will have a definite bearing upon the improvement of colonial trade by investigating new products and studying native sources of supply for raw material. One big problem in hand is the improvement of Indian opium so that its morphine percentage will permit of its use in medicine to a greater extent than at present, for although it is used in the Government hospitals in India, yet it does not come into the English market. Two other laboratories of considerable importance have been opened recently, one at Sharp's Institute in Perth, and the other at University College, Liverpool. This latter has been equipped by several wealthy manufacturers in memory of the late William Gossage, after whom it is to be named, but the most important of these new "features" in our commercial and scientific history is the

Davy Faraday Laboratory

which has been founded, equipped and endowed by Dr. Ludwig Mond. This was formally opened at the close of 1896 by the Prince of Wales, and under the superintendence of Dr. Scott it is now open to the world, for any persons, regardless of nationality or sex, who can show themselves capable of conducting research, will be admitted to undertake suitable work, provided there is a vacancy, and to be able to do this free of cost should stimulate investigators to do something. The laboratory is situated next door to the premises of the Royal Institution, and Dr. Mond has given the premises, equipment and endowment to the managers of this institution for them to control and carry on. Such generosity on the donor's part shows what faith he has in science as the helper of commerce and as a member of the big firm Brunner, Mond & Co. he has had the benefit of practical experience to help him to the conclusion.

Competition, in trade with other countries, has also brought up another subject, namely, the management of the London docks and their charges. The chemical trade section of the London Chamber of Commerce are always striving to get better terms from the dock companies, but so far they have been unsuccessful; a new portion of the West India docks will be available shortly, and the chairman of that company stated recently that this completion will offer much greater facilities than heretofore, but whether this will be so or not, what concerns the brokers chiefly is, will they get their charges lessened or will they have to pay for the so-called improvements?

Dock companies are the same as other companies, and carry on their work for the purpose of manufacturing dividends; in this respect, another company which has caused a considerable outcry has been one which owns the

London Commercial Sale Rooms.

These rooms have been undergoing an absolutely necessary renovation, and as the process has taken some two or three years to complete, the members had to submit to considerable discomfort meanwhile, but now that the work is done the company proposes putting up the membership and entrance fees. The old fees were 10 guineas entrance and 5 guineas annual subscription, but they propose making it £15 entrance and 10 guineas annual subscription to new members and 7½ to existing ones. The members naturally demurred, but as yet have not come to any definite settlement, although one or two gentlemen propose establishing new rooms elsewhere in opposition. Parliament opened earlier than usual this year, but no mention was made in the Queen's speech of any measures to be considered which have any direct bearing on the drug trade. Sir John Lubbock's bill for "early closing" of tradesmen's shops will, however, be considered again, but at present no mention has been made of any steps being taken to amend the Food and Drugs Act, or to restrict the illegal operations of limited companies, and although suicides have been especially rife in London since Christmas, and a large proportion of the victims have succumbed to the effects of carbolic acid, yet no steps have been taken to get it scheduled as a poison.

At the last meeting of the General Medical Council it was reported that about three-quarters of the work on the new pharmacopœia had had been completed, and most probably the new edition would be ready by the end of the present year; great hopes are entertained of the completeness of this work, but since 1885 so many new remedies have been introduced that it will be a difficult task to select the ones which are likely to be of permanent value, and, at the same time to be "quite up to date." Some stir has been made among retail pharmacists by the prosecution of several members of the craft for selling arsenical soap containing no arsenic; the analysts for the prosecution swore to being unable to detect any arsenic in the samples examined, but the manufacturers also swore to putting in an infinitesimal quantity, and so some of the cases were dismissed and others were successful in obtaining convictions. In the cases where the summonses were dismissed the magistrates considered that if the soap contained no arsenic then the prosecution could not be made under the heading of the Food and Drugs Act. This matter is of importance to the "beauty specialists," but it seems a curious idea to designate soap "arsenical" and "for the complexion," and then to leave out the all-important ingredient.

In my letter for November last mention was made of Sir Joseph Lister and a portrait of him given; this eminent surgeon was raised to the peerage at the commencement of the year, and so holds the unique position of being the first surgeon to take a seat in the House of Lords. The honor is said to have delighted his confreres, and every one admits that the benefits he has conferred on mankind justified the distinction.

The Benevolent Fund of the Pharmaceutical Society has been in need of subscriptions lately, and a dinner is to be held to further its welfare in May instead of the annual dinner of the society. The objects of the

Benevolent Fund

are to provide some means of helping pharmacists who are in need and to help the widows of such as are unable to support themselves. An election of annuitants is made annually, the selected candidates being voted for by the donors and subscribers to the fund, and casual help is given to deserving cases. Of late years the demands on the funds have been large and urgent, and to keep pace with this a special effort is being made this year to obtain more subscriptions in order to help the number of really necessitous cases which are continually cropping up.

This letter may reach some who were once chemists in the "old country," and should they desire to help their aged brethren, even the smallest donation will be gladly received by the secretary, at 17 Bloomsbury square, London, W. C., but to those who have left us to go West, and have prospered, I would commend this worthy object and assure them that their gifts would be appreciated and applied to the best advantage for the purpose I have stated.

The obituary of the month includes the name of Sir Thomas Spencer Wells, Bart., F. R. C. S., M. D., the well-known surgeon and gynæcologist, who for many years was surgeon to the Queen's household.

THE METRIC SYSTEM IN ENGLAND.

The English chambers of commerce are now again seriously agitating the use of the metric system in England, and have petitioned their Government for its introduction and immediate adoption. From the activity that is being shown, it would seem that the date of the actual use in Great Britain of the metric system is not far distant. Mr. Balfour, in a recent interview with a deputation sent to consult him on the subject, expressed as the only difficulty in his mind the fact that retail dealers and most of their customers would not be prepared for the complete change from the present old system of measures. In the mean time, the same question has been discussed and likewise urgently seconded at a great many meetings held by parties interested. Mr. Ritchie, president of the Commercial Court, has also brought in his bill regarding the introduction of the metric system in England, and the authorities of the British commercial community have been unanimously urging its use, but all appeals and endeavors thus far have failed, in consequence of the extreme conservatism of the English. Mr. Ritchie has acted most cautiously in the matter, arguing that "there exists no reason for abolishing weights and measures in use for ages," but says: "At the same time, it is an urgent matter of necessity for the English people to become acquainted with a system of measures adopted by the whole continent," excepting Russia, and by nearly all other leading nations, the United States excepted.* The British and American merchants are losing much valuable business because their price lists are issued in the old and inconvenient forms of weights and values. Secretary Balfour, in England, motions to make the metric system legal, and in his bill the exact equivalents between English and metric units are given. At Bradford the subject has been agitated and discussed from every standpoint; the holding of an international congress being in debate, for the purpose of regulating the numbering of yarns. The object of this movement has an army of sympathizers in Germany among the weavers and spinners. A great change has come among manufacturers and machinists, and that change is due to two reasons—they have come to know something of it and to see the great advantages which would be secured in the important matter of convenience and facility, and they also realize that the great European markets are being closed, to a large degree, to all machines and manufactures that are not based on the metric unit. "Great Britain maintained for a long time a leading position among the nations of the world, by virtue of the excellence and accuracy of its workmanship, the result of individual energy; but the progress of mechanical science has made accuracy of workmanship the common property of the world." These words, spoken by the president of the British association in a recent address, are worthy to be remembered by the manufacturers in England and the United States. The adoption of the metric system by the latter would leave England and Russia the only non-metric countries in the world. Very evident is the fact that English manufacturers are being outstripped in a field that was once regarded as peculiarly their own, and this is due to over-caution, want of ready appreciation of new inventions, and slowness to grasp new ideas. The splendid system of technical education with which Germany has provided herself is, of course, another great factor in her advance. Germany, for example, is becoming a formidable rival of England in connection with the South American trade. British exports to South America have been gradually decreasing, while those of Germany have been as persistently rising. The cause for this falling off has been, in part at least, England's delay in adopting the metric system, the English pounds, shillings and pence and yards, feet and inches being absolutely unintelligible to people of the Latin race. This fact and example is fast gaining ground in the United States, where the metric system campaign has been going steadily on. The National Meteorological Society, of world-famous experts, aided by the most influential circles, so interested are all, signify their desire to further the cause.

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*The metric system has been officially recognized in the United States to the following extent: On July 28, 1866, the following was enacted (Section 3569, Revised Statutes, second edition, 1878): "It shall be lawful throughout the United States of America to employ the weights and measures of the metric system; and no contract, or dealing, or pleading in any court shall be deemed invalid or liable to objection because the weights or measures expressed or referred to therein are weights or measures of the metric system." The next section gives the tables of the equivalents of the present weights and measures in the metric system. Section 3880, Revised Statutes, 1878), provides for the furnishing of certain post offices with metrical postal balances for the weighing of letters.

Naturally the almost cosmopolitan use of a system of weights and measures totally different from that employed in the United States places its merchants interested in foreign trade at a great disadvantage. Not only are American price lists confusing to the foreign merchants, owing to the different denominations used, but the fact that foreign lists are made in terms equally unfamiliar to American merchants is said to result in unfair discriminations and often in fraud. (George Sawter, Consul, Glauchau.)

PHARMACY.

TEREBEN.—A yellowish fluid of thyme-like odor and turpentine-like taste, specific gravity is 0.860.

GLYBRID.—A dressing for wounds, consisting of a mixture of equal parts of glycerin and boralid.

CUPRESSIN.—The volatile oil of the Cypressus sempervirens, which serves for inhalation in treatment of whooping cough.

SODIUM TELLURATE.—Recommended in treatment of the night sweats of phthisis, given in doses of 0.01 to 0.02 gm. twice daily.

FERRO-SODIUM CITRATE ALBUMINATE.—A readily absorbable iron preparation, recommended in doses of 1.5 gm. per day as a febrifuge.

THYMACETIN.—An analogous phenol derivative closely related to phenacetin, it forms an insoluble white crystalline powder which may be given in doses of ¼ to 1 gm. in treatment of neuralgic affections.

ASPIDIN ($C_{23}H_{27}O_7$).—A crystalline substance which forms in ethereal extract of male fern. It is soluble in alcohol, ether and alkalies, it is of toxic nature and is being examined as to its therapeutic properties.

HÆMATIN-ALBUMIN.—A fine, reddish brown, tasteless powder, which consists essentially of dried fibrin (blood albuminoids). It is readily tolerated in doses of 1 to 2 teaspoonfuls 3 times daily in water or milk.

PERIPLOCIN.—A crystalline glucoside prepared from the Periploca graeca. It melts at 205° C., is soluble in alcohol and insoluble in ether. In its physiological action it resembles digitalin, strophanthin and ouabain.

ANTIPARASITIC TOOTH WASH.—In 6 liters of alcohol are dissolved 5 gm. of phenol, 15 gm. thymol, 30 gm. of benzoic acid, then add in following order: 350 gm. of tincture of benzoin, 250 gm. of glycerin, 15 gm. of balsam of Peru, 10 gm. of oil of peppermint, 10 gm. of oil of anise, 3 gm. of oil of cinnamon (cassia), 1.5 gm. of Ceylon oil of cinnamon, 0.75 gm. of vanillin and 1 gm. of oil of eucalyptus. The solution is colored to suit with cochineal.

TERPINOL.—A colorless, highly refractive fluid, obtained by boiling terpin with water containing hydrochloric acid, then washing. Given in capsules or pill-form in daily doses of ½ to 1 gm. in bronchial affections.

COPRAOL.—A fatty oil which fuses at 30° C., and congeals at 21° C., obtained from the copra nut. It contains 99.918 per cent. fat, 0.014 per cent. of volatile fatty acids. Copraol is recommended for preparing suppositories, bacilli, etc.

TOOTH-SOAP. Dentist Frohmann, of Berlin, offers the following: Thymol 0.25 gm., extract of krameria 1 gm.; these are to be dissolved in 6 gm. of hot glycerin, then calcined magnesia 0.5 gm., powd. borax 4 gm. and powd. soap in sufficient quantity are added to make 30 gm. of soap, to which 1 gm. of oil of peppermint is added.

GALACTOCHLORAL AND LÆVULOCHLORAL.—These two new chloraloses were prepared by Hanriot (Compt. Rend.), the former by heating galactose and chloral together in presence of hydrochloric acid, yielding shining plates which melted at 202° C. This galactochloral of the formula $C_8H_{11}Cl_3O_6$, is insoluble in methyl alcohol, water and ether, does not reduce Fehling's solution and is converted by potassium permanganate into trichloracetic acid. Under like circumstances with aldehyde and ketose sugars the author prepared lævulochloral ($C_8H_{11}Cl_3O_6$) which melts at 228° C. and is soluble in alcohol and water.

A SENSITIVE TEST FOR NITROUS ACID.—Prof. Riegler recommends (Zeitschr. anal. Chem.) the following test which will answer for general purposes as well as testing for the presence of nitrous acid in drinking water and urine. Into a test tube 2 to 3 cg. of crystallized naphthionic acid are introduced, then 5 to 6 cc. of the fluid to be tested, these are well shaken and 2 to 3 drops of concentrated hydrochloric acid added and again shaken; the tube is then held at an angle and 20 to 30 drops of aqua ammonia are allowed to flow down the side so as to form a layer above the other fluid and at the line of contact a rose-colored ring forms when but the slightest trace of nitrous acid is present.

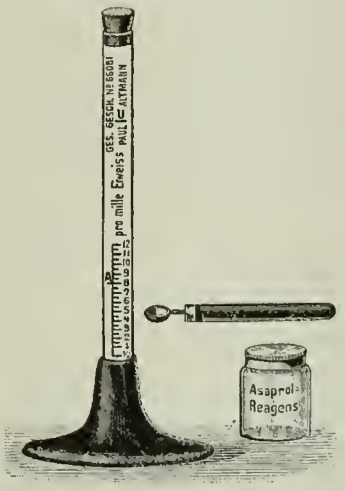
Since dilute solutions of naphthionic acid have a violet fluorescence it is advisable to observe the color by transmitted light.

CHEMICAL VALUATION OF ANTIPYRINE.—On adding to an acid or neutral solution of antipyrine a solution of an iodide containing free iodine a hydriodide of antipyrine periodide precipitates ($C_{11}H_{12}N_2O.HI.I_2$). This precipitate forms a tarry-like mass, insoluble in acidulated water, soluble in alcohol, acetone and chloroform. The presence of hydriodic acid and its salts increases the solubility of the precipitate in water. The precipitation is quantitative in presence of hydrochloric acid, provided sufficient of the iodine solution has been added; also this method serves for the quantitative separation of antipyrine from phenacetine, sulfonal, anilin salts, acetanilid, etc. Anilin salts readily unite under the circumstances with iodine, but the compound formed is held in solution by the acid; however it is advisable in the presence of anilin salts, to filter off the hydriodide of antipyrine periodide as soon as possible.

Each 21.3 cc. of $\frac{N}{20}$ iodine solution consumed corresponds to 0.1 gm. of antipyrine.

The standard iodine solution is prepared by mixing a $\frac{N}{20}$ solution of iodine (containing 10 gm. KI per liter) with hydriodic acid in the proportion that each 100 cc. will contain about 4 cc. of the acid (1.7 sp. gr.). To a concentrated aqueous solution of antipyrine (acidified with HCl.) contained in a glass-stoppered vial, an excess (measured) of the standard iodine solution is added, the fluid which has become turbid is shaken till it has cleared up. The fluid is filtered through asbestos into a burette, then in an aliquot portion of the filtrate the excess of iodine is estimated by means of $\frac{N}{10}$ thiosulphate solution. The difference represents the quantity of iodine consumed in the formation of the double compound with antipyrine.

Owing to the slight solvent action of the hydriodic acid for the precipitate and also that the employment of a large excess of iodine solution causes irregularities, it is advisable to make a few experiments with a known sample of antipyrine.



A SIMPLIFIED ALBUMINIMETER.—The principle embraced in this apparatus of Prof. Riegler consists in securing a complete precipitation of the albumin by means of a mixture of equal parts of asaprol and citric acid, then reading off the volume of the precipitate. The spoon which accompanies the outfit (see figure) is filled with the asaprol mixture, which is thrown into the cylinder, then water is added up to the mark A, and after corking, the cylinder is inverted once to secure solution of the added powder. Then the urine to be examined is added, filling up to the mark U; the cylinder is again corked and inverted slowly ten times; it is set aside for twenty-four hours, after which the height of the precipitate is read off; the nearest line with number corresponding indicates the parts per thousand of albumin. Qualitatively, the addition of 10 to 20 drops of the reagent (5 gm. each of asaprol and citric acid with 100 cc. of water) to about 15 cc. of the urine causes an immediate precipitation if albumin is present.

We have received the British and Colonial Druggist's Diary for 1897. It is the twelfth issue of the publication, and is certainly equal in merit to any of its predecessors. Apart from the ordinary Diary matter, which includes postal regulations, legal information, information regarding the various pharmaceutical and scientific societies, etc., no effort has been spared to render the volume, as a whole, of service to the average British retail pharmacist. In this connection may be mentioned a treatise on "Food Analysis for the Pharmacist," prepared by T. H. Pearmain, Assistant Chemist at the Apothecaries' Hall, and C. G. Moor, M. A., Demonstrator in the State Medicine Laboratories of King's College, London. The only objection to the British and Colonial Druggist's Diary is the trouble in finding the diary.

QUESTION BOX

The object of this department is to furnish our subscribers with reliable and tried formulas and to discuss questions relating to practical pharmacy, prescription work, dispensing difficulties, etc. Requests for information are not acknowledged by mail and ANONYMOUS COMMUNICATIONS RECEIVE NO ATTENTION.

Formula Wanted.

(M. Z. D.) Antidustine.

Cerisette.

(J. K.) See this journal, Feb. 4, p. 139.

Cipadella.

(B. C. B.) Thanks. The information you submit concerning the identity of "cipadella," however, is practically that which appeared in this journal January 21, 1897, page 78.

Copying or Stone Paste.

(J. A. H.) Your query concerning "copying paste or stone paste," is rather indefinite. Please give some information regarding the intended use of the paste and we will try to help you out.

Graduates in Pharmacy and Registration in Florida.

(Sch.—1149.) Section 5 of the Florida Pharmacy Law, enacted in 1889, provides that all graduates of colleges of pharmacy which require a practical experience in pharmacy of not less than four years, before granting a diploma, shall be entitled to have their names registered by the Board of Pharmacy without examination. The fee for registration without examination is $2.00.

Ferrous Sulphate and Nitric Acid.

(E. W. C.) asks how the following may be prepared:

Ferrous sulphate	1 dram
Quinine sulphate	1 dram
Nitric acid	1 dram
Potassium nitrate	4 drams
Water, enough to make	16 ounces

We should dispense this prescription by first mixing the ferrous sulphate with the nitric acid, allowing the mixture to stand until effervescence ceases. This procedure, of course, converts the ferrous sulphate into a ferric salt, but the reaction probably does not interfere with the therapeutics of the mixture. To the solution thus made add about 8 ounces water. In the remainder of the water dissolve the potassium nitrate and the quinine sulphate; finally, mix the two solutions. For a discussion of the above reaction, see this journal, April 23 and May 21, 1896, pages 521 and 649, respectively.

Ink Erasive.

(G. C. R.) Try one of the following:

(1). In two quarts of water dissolve 4 ounces of citric acid, and then add from 6 to 8 ounces of a concentrated solution of borax. This solution is marked No. 1. To prepare solution No. 2 add 2 quarts of water to ¾ pound of chloride of lime, shake well and set aside for about a week; decant, and add from 6 to 8 ounces of concentrated solution of borax. This preparation is used by saturating the ink spot with solution No. 1, removing excess of liquid with a blotter, and then applying solution No. 2. When the stain has disappeared apply the blotter, and wash the spot by the alternate use of clear water and blotting paper.

(2). One-half pound chloride of lime is added to 2 quarts water. Allow to stand 24 hours; then strain, and add 1 dram of acetic acid to every ounce of chloride of lime used. Apply this liquid to the blot without rubbing. When the ink has disappeared absorb the fluid with blotting paper.

(3). Mix equal parts of oxalic acid and tartaric acid in powder. When wanted for use, dissolve a little in water. It is poisonous.

(4). If the color is an anilin red, try a solution of 7 parts sodium nitrate and 15 parts dilute sulphuric acid in 500 parts water, applying to the spot with a camel's hair brush, and rinsing thoroughly.

Dental Modelling Wax.

(W. H. G.)

(1)	Clear wax	200 parts
	Venice turpentine	26 parts
	Lard	13 parts
	Precipitated bole	145 parts

Mix and knead the mass in water.

(2)	Hard paraffin	3 parts
	Resin	1 part
	Olive oil	2 parts (or a sufficiency.)

Rose pink, in fine powder, a sufficiency.

Melt and mix. As paraffin varies in melting point, the quantity of olive oil must be adjusted accordingly.

The Manual of Formulæ, a British work, is authority for this one:

(3)	Stearin	4 parts
	Gum kowrie	8 parts
	French chalk	14 parts
	Carmine	a sufficiency

Melt the stearin, and add the gum kowrie; then gradually stir in the chalk, in small portions, and mix assiduously. Finally color with carmine, and pour into flat dishes to form thin cakes.

Butter Color.

(W. S. R.) Annatto is the basis of nearly all butter color, though turmeric is sometimes added to modify the shade. Dry colors used for the purpose are frequently found to contain annatto, bicarbonate of sodium, borax, etc. Here are two formulas:

(1)	Annatto	1 ounce
	Turmeric	1 ounce
	Olive oil	3 ounces
	Spanish saffron	1 dram
	Alcohol	5 drams

Macerate the annatto and the turmeric in the oil for four days, and the saffron in the alcohol for the same time. Filter the expressed liquids and add enough oil to complete the same measure of the former; mix the two solutions and expel the alcohol by gentle heat.

(2)	Annatto seed	15 pounds
	Cottonseed oil	10 gallons

Heat the oil to a temperature of 212 degrees F., add the annatto seed, and allow to macerate for 12 hours. Let settle, and pour off the clear, dark-colored oil.

We cannot give the formula for the proprietary preparation.

Ammonium Iodide and Tincture of Aconite in Capsules.

(F. M. A.) submits the following:

Ammonium iodide	100 grains
Tincture aconite root	1 dram
Dover's powder	30 grains

Mix, divide and put into 20 capsules.

He asks how it should be dispensed. He says he mixed the ammonium iodide and tincture of aconite in a slightly heated mortar and evaporated a portion of the menstruum of the tincture. He then added the Dover's powder and about 10 grains of powdered tragacanth, making a magnificent mass, easily rolled out and cut into the required number of bacilli which were encased in the capsules. The dose of the tincture of aconite is right as the patient was very sick and had a high fever. The M. D. said the mass was the finest he had ever seen made from the same prescription; also the smallest capsules," etc. The method of procedure was no doubt satisfactory here and so long as the prescriber was so much pleased with the result of F. M. A.'s work, no one can well afford to make objection. However, iodides are incompatible as a rule with organic substances, decomposing them and rendering inert or insoluble the alkaloids, etc. It is a question whether the patient gets the full therapeutic value of the remedies prescribed in this compound.

Elixir Terpin Hydrate and Codeine Sulphate.

(J. O. B. and F. V.) The first of these correspondents has had difficulty with the formula for elixir of terpin hydrate and codeine sulphate given in this journal, May 9, 1896, page 591. Terpin hydrate was precipitated.

The precipitation here noticed is doubtless due to the presence of so large a quantity of water, terpin hydrate being not so soluble in water as in alcohol. We suggest, therefore, that the amount of alcohol be increased, omitting, of course, a corresponding amount of water, or by omitting the water entirely and substituting for it aromatic elixir. Try this formula:

1.)	Terpin hydrate	128 grains
	Codeine sulphate	16 grains
	Alcohol	2 ounces
	Aromatic elixir, enough to make	1 pint

Other formulas which have been proposed are these:

2.)	Codeine	1 part
	Terpin hydrate	8 parts
	Alcohol	600 parts
	Distilled water	600 parts
	Peppermint syrup	600 parts

Dose: Tablespoonful.

3.)	Codeine	1 part
	Glycerin	1 ounce
	Terpin hydrate	80 parts
	Alcohol	1200 parts
	Distilled water	800 parts

Dose: Tablespoonful.

A Glycerine Mixture.

(H.) wants a method of compounding the following:

Morphine sulphate	3 grains
Tincture stramonium	1 ounce
Nitroglycerin	¼ grain
Tincture belladonna	10 minims
Potassium nitrate	½ ounce
Tincture tolu	½ ounce
Tincture (spirit) anise	½ ounce
Beechwood creosote	¼ dram
Chloroform	2 drams
Glycerin, enough to make	6 ounces

Several methods have been tried, the principal difficulty being to secure solution of the greatest amount of potassium nitrate in the liquids of the mixture. The following method seems to be about as satisfactory as any, the resulting compound being at best but a "shake" mixture, though quite presentable. Dissolve the morphine sulphate and nitroglycerin (use a corresponding amount of the official spirit of nitroglycerin) in the tinctures of stramonium and belladonna. Triturate the potassium nitrate with about three ounces of glycerin and add the solution first made. To the balance of the glycerine add the tinctures of tolu and anise, creosote and chloroform, shaking thoroughly after each addition. Mix with the former glycerin mixture and dispense under a "shake" label. Comey (Dictionary of Solubilities) states that 10 parts of potassium nitrate are soluble in 100 parts of glycerine. Creosote is soluble, chloroform insoluble in glycerine.

General Merchants and the Sale of Drugs in New York State.

(W. C. W.) At a meeting held in Syracuse last year the New York State Board of Pharmacy decided that grocers and general dealers in cities and places that are not legally defined as "rural districts" should be permitted to sell the following drugs at retail: borax, sal soda, saltpetre, bicarbonate of soda, cream tartar, ammonia, olive oil, dye stuffs. The sales of poisonous dyestuffs must be registered, and each package containing such poisonous drug must be plainly labeled with the word "poison," as required by the penal code. The retailing of such remedies as paregoric, epsom salt, quinine pills, etc., in the places not legally defined as "rural districts" is held to be illegal, even though such remedies bear the label of a licensed pharmacist.

The phrase "rural districts" in the pharmacy act is declared to "apply only to small villages and country districts having no store where pharmacy is practiced," and the practice of pharmacy is further defined as "the compounding of prescriptions or of any substance to be used as medicine, or the retailing of any drug or poison for medicinal purpose." Domestic remedies are defined as "such as may be safely employed without the aid of a physician, as epsom salt, Rochelle salt, salts of tartar, borax, sulphur, magnesia, camphor, aloes, myrrh, guaiac, arnica, rhubarb, senna, squills, ipecac, and preparations of above; also castor oil, olive oil, origanum, spike, amber, wintergreen, peppermint and wormwood, glycerine, spirits of nitre and other like remedies, but does not include opium, morphine, laudanum, strychnine, arsenic, belladonna, aconite and other poisons requiring knowledge and pharmaceutical skill to safely dispense unless they be sold in original packages, or packages bearing the label of a licensed pharmacist."

From the above abstract of the law, it is clearly seen that a general merchant, whose place of business is not in a "rural district," can sell only the drugs first above enumerated. If he resides in the district denominated as "rural," he, of course, may sell such remedies as indicated, viz., such as may be employed without the aid of a physician.

To Stick Labels to Tin.

(H. Bros. and H. T. S.) In addition to formulas on page 12, July 2, 1896, issue of this journal, the following are submitted, the first of which is taken from the Western Painter.

(1).

(a) Brown sugar	2	pounds
Boiling water	16	fl. ounces
(b) French gelatine	½	ounce
Water	4	fl. ounces
(c) Corn starch	12	ounces
Beat up with		
Cold water	12	fl. ounces
And pour the batter into		
Boiling water	32	fl. ounces

Continue boiling (c) if necessary, until the paste is translucent. Dissolve (a) and (b) separately, and then mix with (c). Paste for tin should not be too thin, and the tin should be free from grease. New tin generally has an oily or greasy surface, due to the tallow or oil used in the plating process. The grease may be removed with an alkali or with benzin, but in a factory where much labeling is done it is better to slightly roughen the surface of the tin where the label is to be placed with a piece of fine sandpaper, No. 0. This paste is very adhesive, and labels pasted with it will adhere nicely, even in a damp place.

(2).

(a) Pulverized gum tragacanth	1	ounce
Pulverized gum arabic	4	ounces
Cold water	20	fl. ounces
(b) Glycerin	4	fl. ounces
Thymol	80	grains
(c) Boiling water	12	fl. ounces

(3). Add 4 ounces dammar varnish to 1 pound of tragacanth mucilage.

(4). Balsam of fir, 1 part; turpentine, 3 parts; use only for varnished labels.

(5). Add 1 ounce of tartaric acid to each pound of flour used in making flour paste.

(6). Water glass (solution of silicate of soda) is recommended as a very good adhesive for this purpose, particularly if the articles are subsequently liable to be exposed to heat. Metallic surfaces should first be rubbed with emery paper before applying the paste; the label is then pressed on with the hand.

Masking the Odor of Kerosene.

(H. A. N.) Various processes have been recommended for masking the odor of kerosene, such as the addition of various essential oils, artificial oil of myrbane, etc., but none of them seems entirely satisfactory. The addition of amyl acetate in the proportion of 10 grams to the liter (1 per cent.) has also been suggested, several experimenters reporting very successful results therefrom. Some years ago Beringer proposed a process for removing sulphur compounds from benzine, which would presumably be equally applicable to kerosene. This process is as follows:

Potassium permanganate	1	ounce
Sulphuric acid	½	pint
Water	3½	pints

Mix the acid and water, and when the mixture has become cold pour it into a two-gallon bottle. Add the permanganate and agitate until it is dissolved. Then add benzine 1 gallon, and thoroughly agitate. Allow the liquids to remain in contact for twenty-four hours, frequently agitating the mixture. Separate the benzine and wash in a similar bottle with a mixture of:

Potassium permanganate	¼	ounce
Caustic soda	½	ounce
Water	2	pints

Agitate the mixture frequently during several hours; then separate the benzine and wash it thoroughly with water. On agitating the benzine with the acid permanganate solution an emulsion-like mixture is produced, which separates in a few seconds, the permanganate slowly subsiding and showing considerable reduction. In the above process it is quite probable that the time specified (24 hours) is greatly in excess of what is necessary, as the reduction takes place almost entirely in a very short time. It has also been suggested that if the process were adopted on a manufacturing scale, with mechanical agitation, the time could be reduced to an hour or two.

For coloring kerosene there is perhaps nothing cheaper than the substance you have been using, viz.: alkanet, unless you may be able to strike upon some one of the aniline dyes. We suggest you write to some of the manufacturers of aniline and ask them for information regarding the pigment you desire, its solubility in kerosene, etc. We cannot suggest the addition of any substance which will cause kerosene not to burn when placed in a lamp.

Soluble Flavoring Extracts.

(Druggist.) Dubelle gives the following for soluble extracts of orange and lemon:

Orange.

Pure oil of orange	1¼	fl. ounces
Carbonate of magnesium	2	ounces
Alcohol	12	fl. ounces
Water sufficient to make	2	pints

Dissolve the oil of orange in the alcohol and rub it with the carbonate of magnesium in a mortar, pour the mixture into a quart bottle and fill the bottle with water; allow to macerate for a week or more, shaking every day, then filter through paper, adding enough water through the filter to make two pints.

Lemon.

Oil of lemon	1¼	fl. ounces
Carbonate of magnesium	2	ounces
Alcohol	12	fl. ounces
Water sufficient to make	2	pints

Proceed as directed above.

A soluble extract, i. e., one which can be diluted with water, may be made according to the following formula proposed by George C. De Lessing, of this city:

One ounce of lemon oil in a 12-ounce glass separator with a stopcock, is mixed with 10 ounces of diluted alcohol of 50 per cent. (sp. gr. 0.9335) and well shaken. After about twenty-four hours, separate the oil from the diluted alcohol, when the latter will be found to be a saturated solution of the soluble parts of the lemon oil, containing about 16 grains of citral and citronellal. Lemon water is prepared by mixing ½ or 1 ounce of the alcoholic solution so made with a gallon of distilled water and filtering, if necessary, through purified talcum. (The use of carbonate of magnesia is thus avoided.) If a stronger solution of oil in water is desired, larger quantities of the essence must be used. To produce a clear solution, add to each gallon of water 1 ounce of polysolve (ammonium sulphoricinoleate). No filtering is then necessary.

For other formulas, see Feb. 21, 1895, Era, page 238. Additional remarks by Mr. De Lessing on the solubility of oil of lemon in aqueous solution may be found in the March 7, 1895, Era, page 304.

Ginger.

(1) Fluid extract of ginger (U. S. P.)	4 fl. ounces
Pumice stone (moderately fine powder)	1 troy ounce
Water, to make	12 fl. ounces

Mix the fluid extract with the pumice stone and shake well during 2 to 3 hours; gradually add water in quantity not over 2 ounces at a time, and shake well; after adding all the water, agitate during 24 hours; then filter till it will run clear.

(2) Ginger root ground	2 pounds
Pumice stone	2 ounces
Lime (slaked)	2 ounces
Dilute alcohol (50%) to make	4 pints

Rub the ginger with the pumice stone and lime; moisten with diluted alcohol: pack in percolator loose, and percolate till 4 pints are obtained; after 24 hours filter.

(3) Strong tincture of ginger root	4 pints
Water	3 pints

Mix well.

Add first solution of

Chloride of calcium	300 grains
In water	5 ounces

Shake.

Add, second, solution of

Phosphate of soda	1½ ounces
In water	15 ounces

Shake well, and to neutralize free acid add 3 drams of carbonate of soda; filter after a day.

Compound Syrup of Hypophosphites.

(E. D. H.) The compound syrup of hypophosphites of the National Formulary, revised edition (No. 378), is a preparation of the general character you outline. Here are two others:

1.) Calcium hypophosphite	256 grains
Potassium hypophosphite	128 grains
Sodium hypophosphite	128 grains
Manganese hypophosphite	16 grains
Solution iron hypophosphite (N. F.)	16 minims
Quinine hydrochlorate	8 grains
Strychnine hydrochlorate	1 grain
Sugar	14 ounces
Distilled water, enough to make	16 fl. ounces

Dissolve the calcium salt in 4½ fluid ounces of water, the potassium and sodium salts in 1 fluid ounce, the manganese hypophosphite in 1 fluid ounce, and the strychnine hydrochlorate in ½ ounce of water, respectively. Rub the quinine hydrochlorate with the sugar and introduce into a graduated bottle; add all the solutions except the iron, and agitate till the sugar is dissolved, or nearly so; then add the iron solution and enough water to make one pint. Shake well and set aside for ten days; then filter through paper. The syrup thus made is of a greenish straw color, and very beautiful.

2.) Iron sulphate, crystals	128 grains
Manganese sulphate, crystals	128 grains
Quinine sulphate	64 grains
Strychnine sulphate, crystals	8 grains
Hypophosphorous acid, 10% N. F.	4 fl. drs.
Calcium hypophosphite	1½ ounces
Distilled water, enough to make	1 pint

Dissolve the sulphates in 4 fluid ounces of water, adding half the amount of the hypophosphorous acid: the hypophosphite of calcium is dissolved in 9 fluid ounces of water with the aid of the remainder of the acid. Having filtered the two solutions separately, they are mixed in a suitable vessel, shaken up well, and set aside to rest for three days. The solution of the hypophosphite of iron, quinine, manganese, and strychnine, thus obtained, is then poured off from the precipitate and filtered, and the precipitate is washed with enough water to make the filtrate measure 1 pint. Once this solution is finished it is an easy matter to finish the syrup, as follows:

Calcium hypophosphite	34 drams
Potassium hypophosphite	17 drams
Sodium hypophosphite	17 drams
Sol. hypophosphite (as above prepared	16 fl. ounces
Orange-flower water	4 fl. ounces
Glycerin	4 fl. ounces
Sugar	6 lbs. av.
Distilled water, enough to make	1 gallon

Dissolve the hypophosphites in 3 pints of water, add the orange-flower water and filter: then add the remaining ingredients. Dissolve the sugar, by agitating without heat, and strain through cotton, which is best effected by placing in the neck of a one-gallon glass percolator at first a plug of excelsior and on top of that some cotton; the syrup runs through very quickly, and is quite as bright as if filtered. Each fluid dram of this syrup contains 2 grains of the hypophosphite of calcium, 1 grain each of the hypophosphites of potassium and sodium, ⅛ grain of each of the hypophosphites of iron and manganese, 1-16 grain of the hypophosphite of quinine, and 1-128 grain of the hypophosphite of strychnine. This preparation is of the same strength as that of the National Formulary with the exception that it directs strychnine to be used instead of tincture of nux vomica.

Provisions of the New York State Pharmacy Law.

(G. A. G.) The pharmacy law applying to the territory of the State outside of New York, Kings and Erie counties (which have separate boards of their own) was enacted in 1884, and amended in 1887, 1889, 1893 and 1895. We cannot publish the various acts and amendments in full, but the following, abstracted from a paper by Prof. J. H. Beal, are the principal provisions:

The board consists of five members appointed by the Governor from nominees presented by the State Pharmaceutical Association. The law provides for the payment of expenses incurred by the board, but does not specify amount of compensation for the members. Meetings must be held at least quarterly.

Two grades of licentiate are provided for. Pharmacists must have four and assistants two years' experience before examination.

The fee for examination and registration is $10 for pharmacist and $3 for assistant. The fee for registration on certificate from another board within the State is $5.

Section providing for the sale of domestic remedies in rural districts by other than registered pharmacists (see answer to another correspondent elsewhere in this department.)

It is implied in section 186 that the board may revoke the registration of licentiates for just and sufficient cause.

The board may retain from penalties recovered under the law the expenses of prosecution, including counsel fees, the residue, not exceeding one-half of the penalty, to be paid into the treasury of the county where recovered.

General Laws.

The following provisions apply uniformly throughout the State, including the counties of New York, Kings and Erie.

The licentiate, by examination, of any board within the State is entitled to registration without examination by any other board within the State upon complying with the formal requirements of the particular law of the district where he desires to practice. In order to obtain a license from any board the applicant must show by affidavit or otherwise that he is a resident of the city or country for which the board was created, or that he intends to practice pharmacy within such district, and that he has not applied for or been refused a license by any board within the State within six months preceding.

The wrongful, negligent or ignorant omission to label any article, or any mistake in labeling the same, substitution, mistake or deviation in the filling of a prescription or order, "in consequence of which human life or health is endangered," is declared a misdemeanor.

Except when dispensed on prescription, every sale or gift of any poison or poisonous substance must be recorded in the usual manner, together with the address of some person known to the dealer, as a witness to the transaction. (This has been held by a police justice in New York City to require a record of all poisons, even though they are not included in Schedule A of the Consolidation Act.) Except when dispensed on prescription, every poison or poisonous substance must bear a label giving the name and address of the seller, the name of the article and the word poison. Morphine and opium and their preparations, except paregoric and other preparations containing less than 2 grains to the ounce, must bear a scarlet label lettered in white letters.

Except on the verbal or written order of a physician, a prescription which contains more than one-fourth grain of opium, or one-twentieth grain of morphine or cocaine, or ten grains of chloral to the dose may not be refilled more than once.

It is a misdemeanor for any person except a graduate in pharmacy or medicine or one having two years' experience in pharmacy to compound a prescription except under the direct supervision of some one possessed of the foregoing qualifications. In case of death resulting from a violation of this provision the offense becomes a felony.

Licensed pharmacists are exempt from jury duty while actively engaged in the practice of their profession.

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Substitution the Concomitant of Cutting.

"Louisville is in a pretty bad fix just now—every man a cutter," is the way a druggist in that city puts it, and in circulars which he distributes to the public he further describes the state of affairs, saying:

"There seems to be a mania prevailing among the druggists of the city to cut each other's throats with the 'Old Chestnut,' 'Cut-Rate Drug Store'; 40 to 50 per cent. saved in compounding your prescriptions; 4-year-old whisky at 25 cents a pint, and other inducements that are false upon the principle of business and common sense. While we are forced to meet the cut on patent medicines, we are not willing to impose upon the unfortunate sick by substituting or palming off upon them, in filling their prescriptions with inert and inferior chemicals, deteriorated by age. In no other way can they afford to fill your prescriptions at a saving to you of 40 to 50 per cent. The consequence is, the sick suffer; the physician is surprised why his prescriptions fail to relieve; the patient and the family throw all blame upon him. This should not be. Have your prescriptions compounded by a competent pharmacist. Take your prescriptions to a druggist that is not running a backroom bar, or has his front door blockaded with whisky signs. There are plenty of druggists in the city who do not sell whisky, not because of their inability to pay the license, but they do not wish to turn their drug store into a saloon; a place where ladies and children can go without coming away feeling that they were coming from a saloon. We do not keep any whiskies. We are strictly a prescription pharmacy, with thirty years' experience behind the prescription case—etc."

The evil effects of a cutting policy are here set forth with emphasis and truth. They are misrepresentation and fraud, substitution the inevitable accompaniment. We are glad to see that this druggist discerns and frankly admits the injury to the patient and damage to the physician's reputation which cut-rate practices in prescription pharmacy surely occasion. Every word in his circular is justified and commendable, and it would be a great good to pharmacy could the public at large be instructed in the same facts and be led to accept them. The people would soon kill drug store cutting were they convinced, of what is the truth, that the majority of cutters reimburse themselves by fraud in medicine dispensing for cutting losses or inadequate profits. No one wants, nor, if he knows it, will accept, inferior medicines; the best only must be dispensed.

Brooklyn Druggists Protest.

"Imbroglio: A complicated and embarrassing state of things." This is an apt description of the situation in which the Kings County (N. Y.) Pharmaceutical Society and the Brooklyn druggists in general find themselves with respect to that portion of the proposed charter for Greater New York which legislates the Kings County Board of Pharmacy out of existence and places the New York College of Pharmacy in full control of the constitution of the board of pharmacy which shall hereafter administer affairs pharmaceutical in this great metropolis. The pharmacy section of the new charter was considered at length in these pages last week. But the society and the college and the druggists of Brooklyn severally and collectively do not like it, and are asking what they shall do about it. They object to acting in the capacity of the tail to the New York College of Pharmacy dog, unless the tail can wag the dog, a proviso which is out of the question in this instance, as in most others.

They are almost willing to see the abolition of their own and all the local boards in the State in favor of the selection of a single board which shall have jurisdiction over the whole State, but they do not want to play second fiddle to any private institution.

But what can they do? Nothing, if all we are told is credible. We are informed that the charter will be considered as a whole, not section by section, by the legislature and passed as a whole, without particular modification or amendment, if passed at all. The thing is to be rushed through with all the force that political influence can lend it, and the little interest which Brooklyn druggists can enlist in opposition to the pharmacy section will meet with no consideration. We believe the charter will go through, and that our Brooklyn friends will have to submit to a condition which is particularly objectionable to them, which we all feel to be radically wrong, and which this journal has had no hesitation in condemning.

The remedy which we see, and which we would earnestly urge, is, after enactment of the charter into law, to put forth every effort to secure a State law which shall supersede the objectionable pharmacy section, which shall abolish all local boards, and provide for their unification and consolidation into one State board. This is both possible and probable, for we do not think pharmacists of the State are much longer going to put up with the present anomalous conditions. It is the height of absurdity and inconsistency that renders it possible for a candidate who has failed in his examination before the New York City Board of Pharmacy to appear before the State board, pass, and then come straight back to the city board and claim registration on the strength of his certificate from the State board, or vice versa.

Let us have one State law and one State board, and divert no funds to any purpose other than the administration of the law.

An Unprofessional Accusation.

A correspondent submits the following copy of a prescription he received to be dispensed.

Sodium bromide	½	dram
Antikamnia	30	grains
Extract cannabis indica	1½	grains
Powdered camphor	3	grains
Codeine	1	grain

Mix, divide and put into 6 capsules. One every 4 hours.

He says:

"I put it up carefully and put in just what was ordered. After the patient had taken one capsule she became very ill from its effects, and as a result the doctor accused me of making a mistake and stated that I had used cocaine instead of codeine in dispensing the prescription. The report has now gone through the neighborhood that I made a mistake and put up a dangerous preparation which would have killed the patient had she repeated the dose, etc. These statements are very damaging and calculated to injure my reputation and business. What do you think of the matter and what steps should be taken to save my reputation?"

The position in which our correspondent is placed is an unfortunate one and his statement tends to show that the prescriber acted in a very injudicious and unprofessional manner, even had he cause for complaint. We would not like to suggest that our friend seek redress in a court of law; still, perhaps, it is the only thing he can do. But before taking a step he should have the benefit of sound legal advice and, at the same time, he should be sure of his position. If no mistake was made, then the prescriber was guilty of uttering a defamatory or slanderous statement tending to destroy the good name and reputation of another, an action for which he may be prosecuted. It would then remain for the defendant to prove that a mistake was made and, therefore, he had the right to make the statements he did. At any rate a judicial decision can only be rendered upon questions of fact, and a jury or court can only determine upon hearing the evidence whether a mistake was made or not.

In discussing this subject we assume the prescription as written is not a dangerous one, for that point is not raised. But such discussion brings out many reasons why the dispenser should be able to prove the various steps he has taken in his work. If he is a careful operator and takes every precaution to guard against error, by having some one to check his work, etc., the chances are that his reputation would suffer but little injury in a judicial investigation. Negligence in dispensing is inexcusable. Ordinarily, a person need use only reasonable care in the exercise of his trade or calling; but in the case of druggists the courts have decided time and again that in the discharge of their duties, druggists, apothecaries, and persons dealing in drugs and medicines should be required not only to be skillful, but also to exercise extraordinary caution, in view of the disastrous consequences which may attend the least inattention upon their part.

Preparing for the Board.

The board of pharmacy examination is the ordeal to which the student of pharmacy looks forward with apprehension. In his studies he ever has in mind the question whether this or that will be of assistance when he is brought to the test. The examination opens or closes the door to a life's vocation which he has deliberately chosen, and it is perfectly natural that he should regard it with this feeling of trepidation. He is vitally concerned, then, in the problem of preparation for the examination, and finds it important that this preparation be of the proper character.

There are candidates whose only purpose is to "get through," who do not value knowledge for its own sake, and who little care what be the nature of their preparation provided it, by hook or crook, will serve to push them through the gate. This class want a short-cut to the goal, and as a rule are never successful in the race of life. The short-cut is a broken reed, as they find sooner or later. For this class we have little of advice, but for the young man who earnestly desires to qualify himself for the practice of pharmacy a few words of direction are cheerfully offered. What follows may, therefore, be taken in reply to the many letters continually coming to us inquiring how to study pharmacy, how to prepare for the board of pharmacy test, what books to secure, and other queries of related character. All these may be covered in a general answer.

We must begin with the axiom that there is no royal road to learning. Hard work and thoroughness are the requisites and concomitants of success. In pharmacy, as in all other callings, it is necessary that the foundation be well laid. A good general education should be obtained. The lack of this is the great defect with which the colleges of pharmacy have to contend. Defects in this preliminary education cannot be remedied in after life, they render the acquisition of special, professional, scientific knowledge extra difficult, and frequently impossible. So lay the foundation well. Mathematics is particularly serviceable, not only by reason of the mental training it imparts, but because it is of direct and constant application in pharmacy. The ability to think in numbers, to reason in proportion and percentage, is the sine qua non in all science. Dr. Prescott says, "It is of the first consequence that the student be not illiterate in his own tongue," and he urges that the young man get through the full work of the ordinary high school course, the best that is afforded, if it be possible. Grammar and penmanship, Latin and German, physics and botany, are branches to be specially considered. The more preliminary education the student has the better able will he be to understand and apply the principles of the special studies which he is later to take up in his preparation for the special profession of pharmacy.

But we will suppose that he is ready to begin his pharmacy course, and that being debarred from college privileges he must prosecute his studies alone, and with the facilities closest to his hand. Let him lay down for himself the guiding rule that his general reading and his study of theories and principles must be supplemented by the actual application of the facts presented, in the way of experiment in chemistry, in manufacturing pharmacy, and in familiarizing himself through his several senses with the physical characteristics of the drugs and medicines he is to handle. There are three main branches of study; Pharmacy proper, chemistry and materia medica, and under one or the other of these may be included the minor special or complementary branches which must not be neglected. The competent pharmacist is expected to be versed to greater or less extent in toxicology, urine analysis, pharmacognosy, botany and the like.

The student cannot get along without books, but he can easily do good work with but a small number of books. Each of the three branches may be roughly divided into the theoretical and practical. The first book the student should secure is the latest edition of one of the Dispensatories. This will serve him as a reference and text-book in pharmacy, chemistry, materia medica, therapeutics, etc. In pharmacy proper, beside the Dispensatory he will find useful Remington's, Coblentz', or Caspari's work, and must, of course, possess the United States Pharmacopœia. But equal in importance, perhaps even more necessary, is a good, wideawake, up-to-date pharmaceutical journal. We cannot dwell too insistently upon the advisability of subscribing for one or more of these publications. In supplementary works in pharmacy the student cannot have too many, and the greater the library he possesses the better will be his facilities for doing good work. The pharmacopœias of England, Germany and France and a number of good formula books should be secured, if possible.

In chemistry, get Attfield's or Fownes' chemistry, for the theoretical work, and for practical laboratory training, Douglass & Prescott's "Qualitative Analysis." In the several branches of botany, materia medica and therapeutics, the selection of books depends largely upon individual uses and preferences, but there should be one or two secured in each branch, in addition to the Dispensatory. Having secured his books, the question obtrudes how should they be used, or how shall the young man study? We recommend to all, for an answer to this question, a careful perusal of the papers published in the series of articles on The Study of Pharmacy, presented in the pages of this journal throughout the entire year of 1895; particularly some of the earlier papers in that series. In the January 31st issue, for instance, there is presented much good advice to the student beginning his work. System should be the watchword. The young man should so arrange his time, especially if employed in a store, that he can devote an hour or a number of hours each day to a particular task in study. Supplement the mental training and the acquisition of information through reading and memory, by the training of the special senses through practical application of the facts brought out in the reading and studying. Thus, if in pharmacy the student is told by his text-book how to make a certain preparation of ipecac, he should learn all he possibly can about ipecac, from the Dispensatory, botany and materia medica, and by securing a sample of the drug itself. Learn its physical characteristics, its appearance to the eye, under the microscope, subject it to treatment with reagents and solvents, test the products, make the preparations prescribed by the Pharmacopœia, and in all these and other ways learn to know ipecac from A to Z. Equally in chemistry, if told that hydrogen is a gas, inflammable, etc., make some hydrogen by the process described; try to see if it will burn, etc. When the Pharmacopœia gives a test to distinguish an impurity of sulphate in a chloride, perform the experiment. In botany become personally familiar by gathering and examining the plants studied.

The whole trend of modern theories of education is toward the practical, manual training. By this training facts become fixed in the mind, the whys and wherefores thereof are plainly established, and the student is not taught to learn by rote, parrot-like, but he knows what he learns and can apply it. System and practice should be the invariable rule with all students. Hard and fast lines of procedure which shall fit individual cases cannot be laid down, but the student will find that as he prosecutes his studies regularly and in order, each fact gained leads to another, which, in turn, opens new avenues of information and research, leading naturally in logical sequence to new facts. If the student wants knowledge for its own sake, and only incidentally and secondarily that he may pass a board of pharmacy examination, he will find that this thoroughness will pay, and that good work brings its own reward in satisfaction of mind and in the attainment of working information of every day and all days application.

To fit some special cases of students who want to supplement and round out a somewhat imperfect and defective training in order that they may satisfactorily pass the board of pharmacy examination, we can recommend to attention the paper published on page 395 of the Era for May 1, 1894, and also that on page 363, Sept. 19, 1895. As general remarks of this nature may not fit the desires of all, we hold ourselves very ready to give advice to individuals upon learning their individual desires.

Correspondence.

We are pleased to publish here communications from our readers on topics of interest to the drug trade. Writers are requested to express their views as briefly as possible. Each article must be signed by its writer, but his name will not be published if so requested.

The Fight on the Substitution Question.

Philadelphia, March 5, 1897.

To the Editor: I have just finished reading an editorial, "The Substitution Problem," in the Era of yesterday, and I wish to express my heartiest approval and praise.

A few weeks ago I ordered the stoppage of my subscription at the expiration of the year, for the reason that I felt that the Era was no longer as active, strong and pronounced in the interests of the retailer (whose champion we are led to believe it is) as it once was, or as it should be.

Since I can find fault let me be more quick to praise and applaud. As a retailer I thank you for thus coming to our aid, and feel very sure that in the coming war between the druggist and the patent medicine manufacturer, with the newspaper as his ally, the apothecary, with every customer almost a personal friend, will not meet a humiliating defeat. I am, truly yours,

W. H. LACEY.

"Get What You Ask For."

[We take pleasure in reprinting the following.—Ed.]

Editor of the Buffalo Commercial:

Under the above heading the Commercial of February 25 contains an article, copied from the Boston Globe, reflecting upon the honesty of druggists.

The first argument used is, that druggists recommend their own preparations instead of so-called "standard" patent remedies. Of course every reputable pharmacist does this, because he knows what his own preparations are composed of; but he has no idea—and cannot have any idea—what patent medicines contain; their formulæ are secret, and it is absurd to call any secret concoction "standard."

The accuracy of the assertion that the so-called "standard" patent preparations are made from the prescriptions of eminent physicians is extremely improbable, since reputable physicians neither keep their prescriptions secret, nor sell them to patent medicine venders. The public generally may be willing to buy anything that is sufficiently well advertised; but the most intelligent portion of the population prefers to buy what a personally-known druggist recommends rather than some concoction which is sold, not on its merits, but by means of the magic power of advertising.

Druggists are accused of being "unscrupulous" and "generally ignorant." To answer this seems unnecessary, since almost all States require that they shall have a proper education, various examinations and license. If, however, pharmacists are "generally ignorant" why, in the name of common sense, do the people trust them with physicians' prescriptions, the dispensing of which requires far more knowledge than a mere mixing of drugs?

The extract from the Pharmaceutical Era (of Dec. 31), a druggists' journal, has been dragged in to giving support to the idea that druggists ought not to recommend their own remedies in place of the much-advertised patent nostrums. Now, what the Era did mean was that substitution in physicians' prescriptions, without the patient's knowledge or the doctor's consent—an act of which no reputable druggist would be guilty—was utterly unjustifiable. A pharmacist, in asking a customer to buy what is compounded in his own store, and of which the composition is known to the proprietor, rather than some secret preparation, is not practicing "substitution," as understood by the Era.

In all sincerity, I ask, has not a qualified pharmacist the right to use his brains and to recommend something that he knows from personal experience to be of value in curing disease, in place of some extensively advertised, but secret preparation, of which he knows absolutely nothing?

The extract from the Boston Globe, although published as an ordinary article, looks very much like the advertisement of some patent medicine house.

DRUGGIST.

Buffalo, N. Y., Feb. 27, 1897.

Substitution: Higher Education for Pharmacists and Physicians,

York, Pa., Feb. 26, 1897.

To the Editor: I herewith enclose you slip cut from a Philadelphia paper of recent date. It would seem to have been inspired by your editorial in The Pharmaceutical Era of Dec. 31, 1896, which strikes me as somewhat hysterical and extremely unjust. Reputable druggists do realize that there are scoundrels in the business as there are such characters in all the occupations of life. The hue and cry made about substitution is the last gasp of the nostrum maker, who feels the competition of the intelligent pharmacist who is supplanting his goods with better medicines of like character.

The physician who dispenses his own prescriptions must needs have an excuse for so doing, and to such a one no hesitation is manifested in casting unjust reflections on the pharmacist. The disreputable man in any occupation or profession cannot always conceal his character. The physicians in any community know who are the honest, reliable and competent pharmacists, just as the people have learned to know the competent physician from the quack, charlatan and fraud. The changing conditions of pharmacy and medicine will develop the physician-pharmacist, and lessen the need of education in the physician, as he seems to be tending to the condition of distributing agent for the pharmaceutical and nostrum manufacturer. The physician seems to be unacquainted with the U. S. Pharmacopœia and National Formulary. The literature of the nostrum maker has supplanted these text-books, and he has been taking his instruction from the latter in the practice of his profession.

You say in your editorial before mentioned, "There are druggists, and not a few, who are guilty of substitution." Now, as a conservator of pharmaceutical morals, would it not be entirely just and proper, besides your duty to the medical and pharmaceutical professions, to expose these scoundrels who are deceiving the physician and cheating his patient. If you have made this statement without proof you stand a chance of having your honesty called in question. The past few years have witnessed considerable change in the mind of the average pharmacist. He is now putting to practical use the design, aim and object of his education, and has become a factor as well as a dispenser of medicine. The druggist who has competed with Nostrum for trade in proprietaries, and yearly sees an increase in the sales of his own preparations with a lessening sale of the Nostrum is on the road to success.

A better education and training in both the medical and pharmaceutical professions is the only hope of putting the two professions where they properly belong.

JOHN F. PATTON.

The Cutter Invades Norfolk.

Norfolk, Va., Feb. 27, 1897.

To the Editor: You have generally very little but good news from this section of our State, and justly so, for we have always been in the lead in everything pharmaceutical. We have the only organized body of pharmacists in the State and for fourteen years we have maintained full prices on patents. Of course, now and then we have had cases of cutting, but it has never affected the entire trade. In the past few days, however, a cutter has appeared in our midst, and with a full stock of patents, particularly patents that are salable, and has put the prices down to cost. How this will work I can't say. The druggists are meeting his prices right from the jump, and he will have to offer stronger inducements to get the trade from its regular channels. All over the city you will find in the windows of our most fashionable stores, as well as the more modest and retiring ones, such signs as these: "We Will Meet Any Cut Price in the City," "Patent Medicines Retailed at Wholesale Prices," "Don't Fear the Cutter, Our Goods are For Sale," and many others. I enclose a list of prices put out by this party. I understand that it is a syndicate and that they operate from Philadelphia and have thirty-eight stores, and are gradually extending their territory. The tendency seems that the cutter has come to stay, and if so then the volume of patents will measureably shrink unless the manufacturers reduce their prices or adopt a plan of selling through a regular authorized agent, and putting their goods only in the hands of druggists. I have such a plan in my mind, which I am willing to give to any manufacturer who will consider it. Just as long as the cutter can get what goods he wants and can make 10 per cent., just so long will he remain to harrass and worry the life out of the overworked druggist. In the face of all this cutting to-day I received a circular from the Wells-Richardson Company, offering to sell the retail druggist two dozen of Paine's Celery Compound for the regular price, less 5 per cent. discount, actually charging us more than they charge the cutter. There is no honesty in this kind of business, and the manufacturers should either do something to protect the druggist, or refuse to sell their goods through his agency. As a general thing business is fairly good and our druggists in good condition financially. Can you tell us who this cutter is? There is no name on the sign and we can only hear that it is a party by the name of Miller, from Philadelphia, who represents a syndicate.

J. W. THOMAS, Jr., Ph. G.

Doctors and Druggists Should Unite for Suitable Legislation.

Delaware, N. J., March 2, 1897.

To the Editor: I very often see in drug journals comments or correspondence similar to that in your issue of Feb. 25, entitled "Doctors Want to Be Druggists." It seems, according to that article, that there is something wrong with the Michigan law, for surely no druggist should be allowed to prescribe. I have some views on the subject, and believe that the State Pharmaceutical Association would do better if it would cultivate more intimate relations with the various State medical societies. I believe a joint committee from these societies would so combine their influence and interests that they would secure satisfactory laws. But to point out a solution is not my object, so much as to give a personal experience of mine, which I think may be of interest and possibly of value. Ten years ago I was a member of the New Jersey Legislature. I was told that a doctor could not have a drug store without passing a special examination. One of the strong arguments to me was that a doctor might be practicing in a country village where he would be required to furnish his own medicines, and that if some one came and bought some quinine pills or paregoric of him, he was guilty of breaking the law. I think this was technically correct. I was asked to introduce a repealer or amendment to the law, and after talking the matter over with several friends in the medical profession, I did so. I looked upon it as an outrageous state of affairs, that the medical profession had allowed druggists to impose on them in this manner. I pushed it with all the force I had, secured its passage by the Assembly, and had reason to believe that it would soon become a law. This caused the Executive Committee of the pharmaceutical association to call upon me. They stated the case to me, and soon convinced me that the law as it stood was just as much to the interest of the doctors as to the druggists. Space will not permit my going into the arguments that convinced me, but I am sure that any fair-minded doctor will soon be convinced if the matter is presented to him in the right way.

I had the bill recalled from the Senate, made a statement to the House that I had been in error of the real effects of my amendments, and after my statement they very kindly killed my bill by my request. Since that time a residence of several years in New York City convinced me more than ever that I did right in trying to keep the law as it was. I remember that at that time I was inclined to think that any one with a medical diploma applying for a druggist's license should not have such a license until he could show a certificate from the State Examining Board for Physicians. But this is a matter of detail. What I wish to show is that the druggists, if they will go frankly to the doctors, will get their help for such legislation as is beneficial to both. Very respectfully,

WM. M. BAIRD, M. D.

Carl Brucker.

Carl Brucker, resident partner of Fritzsche Brothers, New York, branch of Schimmel & Co., of Leipsic, Germany, was born at Frankfort-on-the-Main, Nov. 24, 1858. At an early age he entered the office of Schimmel & Co., at Leipsic, and after becoming proficient in the numerous departments of that famous establishment, was honored with general power of attorney. After representing the German house in Paris, Mr. Brucker traveled extensively throughout Europe, particularly in the South of France, and in consequence, mastered several languages. He is also brother-in-law to Hermann Fritzsche, senior member of Schimmel & Co. In 1892 Mr. Brucker assumed the management of the New York branch, and the recent successes of the firm may be mainly attributed to his energetic measures and keen insight.

Mr. Brucker is connected with several leading German societies of this city, and is a member of the New York Board of Trade and Transportation, being chairman of the Essential Oil Committee of the Drug Trade Section of that body.

ELIXIR OF PYROPHOSPHATE OF IRON, QUININE AND STRYCHNINE.

Quinine sulphate	1 dram
Strychnine sulphate	1 grain
Citric acid	5 grains
Iron pyrophosphate, soluble	4 drams
Alcohol	3 fl. ounces
Spirit orange	50 drops
Syrup	6 fl. ounces
Water, distilled	7 fl. ounces
Ammonia water	Enough.

Triturate together the quinine, strychnine and citric acid, then add the alcohol and spirit of orange; warm the syrup to about 150° F. and add it to the turbid mixture, when, upon stirring, the whole becomes clear. To this add the pyrophosphate of iron previously dissolved in water, and then add water of ammonia drop by drop, stirring well, until the solution is perfectly neutral to test paper. Lastly filter.—(J. A. Carnes in W. Dr.)

(Specially Contributed.)

RECOLLECTIONS OF AN OLD-TIME DRUG CLERK.

By CHAS. D. DESHLER, New Brunswick, N. J.

(Concluded from page 267, March 4.)

Any view of the business at that time would be very imperfect which left out of sight the part borne in it by the younger drug cleks and their condition. Their lot was a pretty hard one, but it is due to the truth to say that in the long run it proved a wholesome discipline to them; certainly they were none the worse for it. Unlike the younger clerks of our day, they had not eaten sufficiently of the fruit of the tree of knowledge to know how hard it was, or to care much about it. They were kept incessantly at work, and their hours of work were long. They had but little time for mischief, and, as the event proved in after life, they had no cause to lament that such was the case. They acquired fixed habits of industry and application. They were preserved from numerous temptations to which the younger clerks in other less exacting callings were exposed, and to which they too often succumbed. And they enjoyed their few holidays with a zest and relish of which clerks nowadays, with their frequent holidays and comparatively short work hours, can have no conception, and with a freedom from excess which contrasts favorably against the license often indulged in now by some of our junior clerks.

But although our noses were then held close to the grindstone, and if we had but little spare time at our disposal, we had our own fun, and I venture to say it would be hard to find any fellows nowadays who have the ability to crowd more mischief into a limited space of time than we did. Much of our fun and mischief found their opportunity in connection with our business, as the following anecdotes of my own experience will disclose.

At that time there were a great many apprentices to the various trades that were prosecuted in our town, and in the vicinity of our store there were several large shoemaking shops which had their full quota of apprentices. The younger and greener of these were the butts and fags and scapegoats of the older apprentices and the "jours," who indulged in much horseplay and many rough, practical jokes at their expense. Thus: When the hands of a new apprentice became black and grimy and rough from the dirty work which was shuffled upon him by the older apprentices, they would send him with some of his hard-earned savings to the drug store with instructions to invest in sixpence or a shilling's worth of pigeon's milk, assuring him at the same time that it would make his hands soft and white. Of course the older apprentices had been through the mill themselves and knew what would follow. The young gudgeon invariably applied for the mythical pigeon's milk to one of the younger drug clerks, and he, being in the secret, would give him with an air of grave importance the coveted specific, in the form of an infinitesimal quantity of linseed oil and lime water, with directions to rub in a few drops night and morning. As these directions also included the injunction to be careful and wash his hands with soap and water before applying the pigeon's milk, or otherwise something frightful would happen to him, it is probable that the specific sometimes proved reasonably efficacious. At any rate, we had his sixpence or shilling. As almost all these apprentices belonged to the lower classes and were exceedingly ignorant, they were very superstitious. They believed in spooks and witches and were terribly afraid of both. The older apprentices, working on these fears, would send the younger ones to us for "spook oil" or "witches' grease," as the case might be, when we mysteriously gave them a small vial of vile smelling liver oil as a charm against spooks, or an ointment composed of a little lard and a good deal of powdered asafœtida, to be worn as an amulet against witches. I can safely vouch that no apprentice who was thus panoplied ever thereafter saw a spook or suffered from the cantrips of a witch. At the risk of being considered irrelevant, I will here interject that it was a standing joke in the workshop itself to hand a green apprentice a cent and bid him go to the foreman of some other shop and ask him for a cent's worth of stirrup or strap oil, with the result that the foreman would seize the unfortunate greenhorn with one hand, and a shoemaker's strap with the other, and belabor him therewith till he had enough stirrup oil to last him for many a long day. We may be sure that no prentice was so green as to be caught a second time in this way; and we may also be sure that he would be among the first to pass the trick on to some other fellow still fresher and greener than himself.

The darkies of that day were even more superstitious. They were implicit believers in the powers of roots and herbs and were frequent applicants for them in order to counterplot against their enemies and neutralize their evil incantations. They would declare that such or such a nigger was "rooty," and that he had laid a spell on them by placing some "power-root" over the lintel of a door under which they had been obliged to pass, and they must have some blood-root or old-man-in-the-ground, or Solomon's Seal, or sweet fern, to chase away the spell. They were even yet better customers for "love-powder," for which they always applied to us juniors, with earnest appeals to our sympathy and secrecy, and with which we always sent them away rejoicing, after having pocketed their shilling or quarter. For our part, we exercised not a little high art in dealing with these credulous fellows. When one of them craved a love-powder we demanded to know with the utmost exactitude whether his inamorata were light or dark yellow, copper-colored or downright black, after which we adjusted the powder accordingly, and with a great show of mystery, either of powdered pale, or dark yellow, or red Peruvian bark, or of black cherry bark. We then enjoined upon him that he must never let it go out of his possession even for an instant, and that he must swallow it before he crossed under the lintel of the door of the house where his sweetheart lived, while his thoughts were fixed intensely on her. One honest fellow whom I once assisted in this way, came to me a few days afterward in great glee, and told me that the thing had worked first-rate, and that his girl, who before had told him half-a-dozen times "to g'long about his business" had now promised to marry him. And she did, and sent me a piece of the wedding cake. Both she and her husband always regarded me as in some sort their benefactor, for in their case, humble though they were, marriage was not a failure. He repeatedly declared that if it hadn't a'been for me his wife wouldn't a'had him; and his wife, who had learned the whole story, did not contradict him. So he must have been right!

One of our old-time darkies, known to all us boys as "Har," was a jolly, good-natured fellow, very bright and witty except when he was drunk, which was not seldom, and then he was a great fool and a portentous bore. One day he came into our store decidedly under the weather from drink, while I was engaged at putting up seidlitz powders. He was feeling "dreadful bad," he said, and he pestered me to give him something to relieve him. Full of mischief, I assented, mixed up the acid of a seidlitz powder in one tumbler half full of water, and the alkaline mixture in another, and then administered them to him separately, one immediately after the other. Of course the effervescence, instead of taking place before drinking, as usual, took place afterward with the most amusing results. Har spluttered and hiccoughed, and hiccoughed and spluttered, the mixture forced its way out of his mouth and nose, tears streamed from his eyes, and he was literally frightened sober. After that, no matter how drunk Har might be, Har knew enough not to trust me to give him a dose of medicine again, though, for my part, I should never have repented the joke a second time, for I was nearly as much frightened as he at its remarkable effects.

A former schoolmate of mine, who was a clerk in a neighboring store, fell into the habit of dropping into our store in the evenings, when he would pester me with queries about the work on which I happened to be engaged. It was a rule in our establishment that we must not hold prolonged talks with anyone while we were busy with anything that required our attention, but must devote ourselves exclusively to it. On a particular evening when I was thus occupied he was specially inquisitive; and as I did not reply to him as freely or as cordially as he thought was his due he became offended, put on frills and made some contemptuous comparisons between his leisure and my slavery, and also between his trig clothes (he was a natty dry goods clerk), and my coarse overalls. Of course my dander rose and I made up my mind then and there that I would get even with my lad. So, betimes one evening, when I knew he would make one of his customary calls, I lifted our largest iron mortar upon the counter, placing its seven-pound pestle beside it, and then sprinkled a goodly lot of fulminating powder over the bottom of the mortar. In due time he made his appearance and began his usual questioning, which I managed to divert to the big mortar and pestle. It was not long before I succeeded in irritating his bump of combativeness by insinuating that it was a man's work to handle that pestle and more than a match for the muscle of any womanish counter-jumper. This nettled my lad tremendously. He got mad, said he'd show me that he could handle it as easily as I, and, coming behind the counter, he took it up, flourished it around, and wound up by plumping it into the mortar so that its whole weight came squarely on the fulminate. The consequences may be imagined. The fulminate exploded with a whiz and a bang, knocked the pestle out of the young gentleman's hands, half-suffocated him with its smoke and vapor, more than half frightened him out of his wits, and he got out of the shop without standing on the order of his going. Repeatedly afterward, when we had both grown to man's estate, my quondam victim recalled this incident and declared that it was the best practical lesson he had ever learned, and had done him a world of good.

While I was a pupil in Rutgers College Grammar School I contracted an acquaintance with a young collegian, whom I shall call Dalton, which, notwithstanding the disparity of our ages, had ripened into a close intimacy. When the incident occurred which I am about to relate, Dalton had graduated from college and was prosecuting his studies in the Theological Seminary. He had for a room-mate another young gentleman from some other college, whom I shall call Ranney, also a theological student, with whom I became on very friendly terms through Dalton's instrumentality. Both were frequent visitors at our store, and, being wealthy, were generous purchasers of such articles as they needed or fancied, which they made it a point to buy from me. Among his other purchases, Ranney often included two or three bottles of Madeira wine, alleging, truthfully I have no doubt, that he had been ordered by a physician to take it as a remedy for the general debility with which he had been threatened. At this time, however, he was as vigorous as a wood-chopper and free from every sign of debility, general or particular. Dalton was much concerned at his friend's too liberal use of wine, and several times remonstrated with him against it, but without effect. Finally Dalton took me into his confidence. He lamented Ranney's dangerous fondness for wine ,and declared that already he was so much a slave to it that he resorted to it on the most flimsy and transparently feigned pretexts. We had several conversations on the subject. It was suggested that on some pretext I should not sell Ranney any more wine, but this was abandoned, since he would have no difficulty in buying it elsewhere. At length a brilliant idea flashed on my mind. Suppose, I said, that we make him sick of wine, by introducing into one of his bottles a sufficient quantity of the wine of ipecacuanha to thoroughly nauseate him, but not enough to do him any harm. Dalton jumped at the suggestion, pronounced the idea a good one, and urged me to "doctor" two or three bottles in this way and have them in readiness against the time when Ranney should order another supply. This I did, having studiously consulted the Dispensatory and ascertained the proportion of the medicated wine that might be safely added to each bottle of the Madeira. Soon afterward, as Dalton had foreseen, Ranney ordered another supply, when the three "doctored" bottles were sent to him and the two conspirators solicitously awaited the result. This was soon apparent, for after three or four pretty liberal draughts poor Ranney looked the most wretched and woe-begone of mortals. And I have no doubt that he felt to the full as wretched as he looked. He moaned that he was miserable. He declared that he couldn't read, he couldn't sleep, he couldn't eat. Study was out of the question. He cared for nothing, had no interest in anything. He was direfully sick at the stomach. The more often he flew to the wine for relief the worse he felt, till instead of craving it he began to feel an utter disgust for it, which at last was converted into absolute aversion, and he retched at the mere thought of it. Of course he stopped drinking it and gradually his wretchedness was mitigated, his relish for food returned, he had long and refreshing sleeps, his interest in things revived, and he looked as bright as a new pin once more. But his taste for wine was gone, and the other doctored bottles remained untouched by him, till one day in a fit of disgust he threw them out of his window. Ranney never learned the truth of the matter, for Dalton and I religiously guarded our secret, and chuckled over it not a little. Both these gentlemen afterward became distinguished and justly esteemed clergymen and doctors of divinity.

There was a gentleman in our city who affected to be and had the reputation of being a great authority on wine. Several times he had bought at our store half-dozen lots of bottled Madeira, which were part of a lot which I had myself filled from a barrel of South Side Madeira which we knew to be an original package. Hitherto it had given him entire satisfaction, but one day he entered the store looking very sour and crusty. The last half-dozen of wine we had sent him he declared was wretched stuff, it was vile, it wasn't fit for a horse to drink, and he should send it back. This was done, and in his presence I was charged to send half-a-dozen other bottles, about which there could be no mistake. I regret to say that, instigated by the old Adam in my nature, I took the maligned bottles into the cellar, and, after filling up the half-emptied one, shoved the noses of all six into the dusty cobwebs which hung in plentiful festoons around the beams and in the corners till they assumed the appearance of venerable age. Wrapping them up with the cobwebs still adhering abundantly, I delivered the same identical bottles that he had returned to the gentleman, and then expectantly awaited the issue. It was not long deferred, for a few days later he entered the store smiling and radiant. "Ah!" he said, rubbing his hands. "That last wine you sent me is superb! I have not tasted such nutty Madeira in an age ! By Jove ! It's splendid! I must have a dozen of it. Hey! Charley, see that you take it out of the same bin!" Fortunately, I found cobwebs enough still remaining in the cellar to make the necks and noses of the new dozen look as old and dusty as were the first lot, and for months afterwards I had to listen with a straight face while our connoisseur lavished his praises upon the wine which he had once pronounced "wretched," "vile," and "not fit for a horse to drink," but which had become "superb" and "nutty" through the agency of a lot of cobwebs.

Having furnished this pretty conclusive evidence that the junior drug-clerks of those days had some "snap," despite their hard and prolonged work hours, let us now glance at the daily routine work of one of them—in fact, of myself. Thus: My day's work began, in summer, with taking down the inch bars from and opening the window shutters at 5.30 in the morning, and ended with closing and barring them again at 10 o'clock at night; and in the winter, by going through the same performances respectively at 6.30 in the morning and 9 o'clock at night. Then successively I made the fires, swept out and sanded the floor, hung out the signs (which were generally in kind), cleaned, trimmed and filled the hanging, side and hand lamps, polished the scales and other brasses of the establishment, and cleaned off the various measures that were used for sperm and other lamp oils. There was then an intermission of half an hour for breakfast. When that was despatched, in the intervals of waiting on occasional customers for sand, lime, paints, oils, doses of salts and castor oil, and a few pennyworth of paregoric, Godfrey's cordial, black or Scotch snuff, saleratus, etc., I was obliged to wash and replenish such of the quart tincture bottles as were in most constant use, to fill up the various filtering funnels, which had run empty during the night, and to cleanse the glass of the show cases and of the inside sashes of the show windows. By this time, if it were a fair day, business had set in, and from then till tea-time, with the exception of another half-hour's intermission for dinner, I was incessantly busy measuring all kinds of oils, weighing all sorts of paints, dye-stuffs, and other articles; measuring tar, lime, sand, cement, plaster, etc.; rolling and loading barrels, with an occasional spell behind the counters putting up sundries, both fluid and solid, which had been ordered by country merchants, or waiting on some retail customer. After tea, just as when "the evening shades prevail, the moon takes up her wondrous tale," so also did I assume mine. First, the floor must be cleanly reswept and sanded, and then I was set busily at work, with occasional interruptions to answer calls from customers for one thing or another, in putting up gross after gross of soda and seidlitz powders, and still many another gross of essences, tinctures, and proprietary medicines, together with dozens of bottles of ink, Stoughton's bitters, bay rum, cologne, etc., and other dozens on dozens of packages of medicine and of various paints and dye-stuffs, preparatory to the possible demand of the next day. It was the rule in our store that the clerks should never sit down during business hours, and I am speaking the literal truth when I say that I never did so, except at my meals, from the opening of the store in the morning till its closing at night. There never was an idle moment. If the routine work were done and no customer waiting to be served, there were sundry preparations to be made; there was opodeldoc, or British or Harlaem oil, or balsam of honey, or Turlington's balsam, or Godfrey's cordial, or paregoric, or essences, or cologne, or hair oil, or some other article for which there was a steady demand, to be filled and put up in dozen-packages; there were soda and seidlitz powders to be put up, castile and other soaps to be sawed into salable sizes, spices to be ground, roots and drugs to be powdered, syrups, cerates and ointments and plasters to be made—in fine there ever was something or other to be done, and it fell to the lot of my chums and myself to do it. In addition to what I have already specified, we assisted in boiling linseed oil and in making varnishes; and regularly on Saturday evenings we were required to wash all the quart tincture bottles—some fifty or more in number—and then wound up the evening after the store was closed, by scrubbing and oiling the counters. All this was diversified, on dull or stormy days, by varnishing the drawers and closet-doors, together with the labels of all the tincture bottles, painting the ceiling and the plain wood-work, and at suitable intervals by a general wash-up of all the tincture and show bottles, and of the windows, inside and outside.

Notwithstanding the long and laborious hours which were the lot of the junior clerks in our drug stores, and of the apprentices to many of the trades, these young fellows felt the craving for intellectual advancement, and under its impulse worked hard and in the face of many disadvantages for mutual self-improvement and culture. Ten or twelve of us formed a musical club, at which, under the direction of a competent teacher, we met once a week by turns in the stores where we were employed, after they were closed for the day, and practiced ourselves in sacred and secular music, in which some of us became experts. We also had a vigorous Debating and Composition Club, which was made up in part of those who belonged to the Musical Club, and, in part, of others who had no taste for music. Among the more active members of our Debating Club were Tom Hill, then like myself a drug clerk, who afterwards became the president of Harvard; Jake Zabriskie, then an apprentice to the tailoring business conducted by his brother, Col. James C. Zabriskie, and who afterwards served as a captain in the Mexican War and was killed at Cherubusco while fighting bravely at the head of his company; George Ellis, then a young clerk for Terhune & Letson, and afterward, successively cashier of the old State Bank of New Brunswick and of the Bank of the Commonwealth in New York City; John Denison and Munroe Letts, also tailors' apprentices and bright lads, who became useful men; Tom Fitzgerald, an apprentice to the printing business as conducted by the publishers of the New Brunswick Times, a brilliant young fellow, who, when he was "out of his time," went to Philadelphia, where he became a prominent citizen, a colonel and the founder of the "City Item," a popular society and literary paper, which I believe is still conducted by one of his sons; Jo. Page, a son of the old baker, Henry Page, an indomitable arguer and very solid fellow, who afterwards became a clergyman. There were a number more whose names do not occur to me, but they were all earnest fellows, and I think all of them turned out intelligent and honorable men. I was the president of the club, and never missed a meeting. Indeed, we all worked hard in preparing ourselves creditably for its exercises, stealing many hours from sleep in order to do so. When we met, which was weekly, sometimes in the old schoolhouse at the foot of Liberty street, and sometimes in the basement of the Presbyterian session room, we indulged in some very enterprising discussions and exhibited some very pretentious oratorical pyrotechnics, it may be, but at the same time we insensibly acquired a great deal of particular and general information, together with something of the art of applying it impromptu in our debates.

There was a phase of the experience of the druggist of half a century ago which should not be lost sight of, though it relates less to himself than to his customers, albeit that he too was not a cipher in the matter. It was then the almost universal custom, and the usage may still survive, for our farmers and country folk generally to indulge in the luxury of what was then known as "Spring Physic." Regularly on the return of spring each one of these dosed himself, and his wife, and his son, and his daughter, his man servant and his maid servant, his ox and his ass and everything that was his, the former with generous doses of salts, senna and manna, or castor oil, and the latter with glauber salt, powdered black antimony, or horse balls. Even the pigs and chickens came in for their share of the general physicking. In town this practice was "more honored in the breach than the observance," but the omission was fully compensated for by the weekly doses that were resolutely swallowed by our people. On Saturday nights especially, there was a rush to the drug store for doses of calomel, calomel and jalap, rhubarb and magnesia, compound cathartic and Lee's pills, castor oil, epsom salt, and other active cathartics, whose effects our mechanics, laborers, artisans, and townsmen generally only found the time for or had the leisure to attend to on Sundays.

I doubt, however, if any of these folk took a bigger dose than I have now administered, but I sincerely trust that here the parallel ceases, and that the effects which may now be experienced may not be similar to those which attended my early ministrations as a half-fledged apothecary.

The End.

Dispensing by Physicians Defended.

Druggists sometimes wonder what valid arguments doctors find to defend their practice of dispensing their own medicines. A physician, writing to the Atlantic Medical Weekly, tries to give some of these arguments. What do druggists think of their soundness and justice? He says: Every physician should dispense his own medicine. While we do not wish to harm, or in any way injure or cast reflections upon our druggists, yet we all know that the evils and inconveniences connected with a system of prescription writing are many. Some of the evils of not dispensing our own medicine I will mention:

First—Substitution.—If we are to rely upon information which I think is reliable—substitution is practiced to an alarming extent. Perhaps we know something about it experimentally.

Second—Repetition of prescriptions.

The patient not only gets the prescription refilled for himself—possibly when the medicine is no longer beneficial but actually harmful—but also recommends it to his friends whose ailments he diagnoses to be the same as his own. Thus the physician loses subsequent calls from the same patient and also from others for whom the prescription is filled. If prescriptions are to be written, it should be done with the explicit understanding with all parties concerned that they are not to be refilled under any circumstances without the consent of the writer.

Third—Omission of drugs.

It often happens that the druggist does not have in stock one or more of the chemicals mentioned in the prescription; rather than to lose his fee the druggist will compound the medicine minus what he does not have in stock. This omission oftentimes will change the physiological action of the medicine, thus defeating the purpose for which the medicine is prescribed, and often acting in a harmful manner to the patient.

Fifth—Error in compounding.

The filling of prescriptions is often undertaken by those who have no adequate knowledge of how the work should be done.

Sixth—Loss of time to the patient.—

It often happens that the condition of the patient is such that a remedy is required immediately. If the physician has the remedy at hand, much valuable time will be saved. It is often very inconvenient for the patient to send to the pharmacist, especially if the medicine is needed in the night.

Seventh—Knowledge that the druggist or other parties obtain as to the disease of the patient.—

The nature of the remedy is a key to the nature of the disease. Most patients do not care to have the nature of their malady revealed in this way, especially if the disease has to do in any way with the genital or urinary organs.

Eighth—Knowledge that the patient obtains as to the nature of the remedy prescribed.

Every physician is fully aware of the fact that often it is not best for the patient to know what drug he is taking. The patient may know that certain drugs are poisonous or he may be prejudiced against certain drugs. A knowledge of the drugs prescribed under these circumstances is not conducive to the best interest of the patient.

Sometimes the physician wishes to administer a placebo; it is very evident that the patient should not be so informed.

Ninth—Financial loss to the physician.

It often happens that the patient has not enough money to pay for the advice and the medicine, with the result that the physician charges his fee, while the druggist gets the money. It is difficult for a patient to understand that a physician must have pay for his advice, but if a quantity of medicine accompanies the advice, it is much more satisfactory to the patient.

The Language of Prescriptions.

George W. Turner, M. D., St. Louis, in Medical Fortnightly, indulges in a little kindly criticism of his brother physicians, which will be not ungrateful to the long-suffering druggist. He says:

Here in America, very few of us are classical scholars, and, frequently, the language of our prescriptions is something appalling. One can readily demonstrate this in a few minutes, by a glance over the files of his nearest drug store. Campbell says, "In the United States prescriptions are usually written in a language called, by courtesy, Latin, although we doubt very much if Horace or Cicero would ever suspect that the conglomerations of abbreviated medical terms which are sent to our drug stores were specimens of his native tongue." Chief among our faults is the use of incorrect Latin word endings. There is no excuse for not using correct Latin terminations, the more especially when we remember that from a dozen to a score of drugs about cover the field of every day practice. By memory, pure, simple and unaided, the endings of these may be mastered; but the principles of Latin case endings are so simple and so few that they may be readily learned in a couple of hours by any one with brain enough to memorize the branches of the seventh cranial nerve in the same time. A favorite sin against terminology is abbreviation. Like the grave, it hides our ignorance. It cuts off mistakes in terminology, of course; they "die a bornin'." Abbreviations are generally inadmissible, and always so with the chief word of the drug name. They are æsthetically objectionable, but the vital objection lies in the fact that mistakes may easily be made in the filling of them—mistakes always fatal to the intended therapeutic result, and often to life. As examples: Acid. Hydro. may be hydrocyanic acid, hydrochloric acid or hydrobromic acid; hydr. chlor. may be hydrate of chloral or corrosive sublimate; sulph. stands for sulphur, sulphate, sulphite or sulphide. These examples may be multiplied almost indefinitely. It has been held by the courts, that, on a fatal "accident" following this kind of prescribing, the physician and druggist are equally guilty of manslaughter.

Again, there is the error of barbarism of language—the mixing of two or more tongues in the same term or formula. Stick to one language; do not write "Chinin sulphatis" to keep your patient from knowing that he takes quinine, and then finish with "Extracti gentianæ." It constitutes a barbarism as grievous as those for which Pitou felt the chastising cat-o-nine-tails, and received the final dismissal by the erudite Abbe Fortier, as related by Dumas in "Taking the Bastile."

When using ad. only, the ingredient is in the accusative case, but when using q. s. ad., it is in the genitive; a common error under this head is the use of aquæ ad instead of aquam ad.

When using a simple formula, in which the ingredient is not weighed or measured, but counted, use the accusative case. Thus: ℞ Pilulas phosphori, not ℞ Pilularum phosphori, nor, as is more frequently written, ℞ Pilulæ phosphori.

A strict adherence to the rules of grammar dictates that only the first word in a drug name shall be begun by a capital letter, but the custom has been to begin each word by a capital. However, the tendency of the best writers of the day is to follow the grammatical rule, rather than the custom.

While not directly pertaining to the subject under discussion, I cannot refrain from saying, write legibly. If you cannot write, print; if you cannot print, you may follow the method of a learned (?) M. D. of our city, have your prescriptions printed in advance—a machine-made practice, so to speak. Often on seeing prescriptions, not one word of which I could read, far less legible than a baby's first crude scrawl, I have been forced to believe that pharmacists are blessed with a special sense, aside from sight, by which they decipher these alleged characters.

These hasty and illy arranged remarks were inspired by the inspection of the files of several drug stores in this city (where we boast of being fin-de-siecle in medical matters), in the company of a medical friend, educated in England and the Continent. His astonishment at and opinion of our laxity in this respect may well be imagined. We should not forget, that, as "The apparel oft proclaims the man," so the prescription oft proclaims the physician.

Liquid Crystals.

This name would seem to be self-contradictory, for all the crystals with which we are familiar are solids, and cease to be crystalline on melting. It has recently been discovered, however, that in some interesting instances the crystalline properties of substances are retained after they have passed from the solid to the liquid form. The experiments that prove this, though they have been carried on in Germany for the last seven years, are comparatively unknown in England and America, and English-speaking scientific men are much indebted to Prof. H. A. Miers, who has collected a large number of facts concerning these experiments in Science Progress (Lit. Digest). As a typical instance of the curious substances mentioned above, he cites a recently discovered hydro-carbon compound named azoxyphenol. Its solid crystals behave as follows:

> "Warmed on a microscope slide they are suddenly transformed, at a temperature of 134°, into a substance which preserves the outline of the crystal, is strongly doubly refractive, becomes dark four times when rotated on the microscope stage between crossed Nicols, and, therefore, behaves in all these respects like a true crystal. As is well known to all students of the subject, crystals differ from other substances in being anisotropic (possessed of different properties in different directions) while they are homogeneous; that is to say, all the properties of a crystal, while the same along parallel lines within it, are in general different in different directions. In the matter of their optical properties this character expresses itself in the double refraction exhibited by all crystals, save those which belong to the cubic system; and as a result of this birefringence, if the crystal be placed between two polarizing Nicol prisms, whose principal planes are at right angles, light is in general transmitted through the combination and is only extinguished four times as the crystal is rotated through 360° on the microscope stage.
>
> "Azoxyphenol at 134°, therefore, behaves in all these respects like a crystal, but, incredible as it may seem, is nevertheless a liquid; it does not retain a geometrical form, but is free to move in all directions.
>
> "If the preparation be still further warmed, it passes at 165° into a third modification, which is also liquid, but not doubly refractive. It is possible to contrive that this molten substance shall contain small portions of the first, birefringent liquid which float about in it as perfectly spherical drops."

We cannot note here the different theories that have been advanced to account for these facts; we need only to say that their discoverer, Lehmann, regards the liquid modification as truly crystalline, and he therefore would remake all the definitions of the word "crystal" found in our text-books and dictionaries. Explaining Lehmann's views, Prof. Miers says:

"Ordinary crystals are solids which can be deformed up to a certain point without any permanent change being produced in their form; they may, for instance, be bent by pressure and then return to their original form when the pressure is removed; unless the limit of elasticity has been passed, when they are permanently deformed or broken. Now Lehmann has found that in many crystals the limit of elasticity is so low that without actual disruption they may by the application of very slight force be made to flow like shellac or certain other amorphous substances. He has long expressed his opinion that the essential feature of a crystalline structure is not, as is commonly supposed, the regular arrangement of particles which are held together by elastic forces to form a more or less rigid structure. If this were the case, he argues, a sufficient deformation would destroy the structure and reduce the crystal to the amorphous condition, and this has never yet been effected.

"He inquires, therefore, whether the limit of elasticity may not in certain crystals be not only extremely small, as in the soft substances previously described by him, but actually zero, so that the material may be liquid and yet crystalline. If a liquid exhibits polarization phenomena similar to those of a deformed crystal, is there any reason, he asks, why we should not regard it as a liquid crystal?"

In conclusion, Professor Miers makes the following very sensible suggestion:

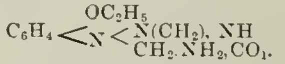
"If I may venture on a word of criticism, I would urge that here we are concerned partly with a question of words. It will be wise to retain the names crystal and crystalline in their old significations, rather than to extend them so as to include the birefringent liquids whose existence has been established by Lehmann. It may be that these remarkable drops are examples of liquid matter in which particles while free to move are compelled to preserve the same orientation, and differ in this respect from ordinary liquids. But whether this peculiarity of structure, whatever may be its nature, is really analogous to that of solid crystals is a question in which it will be better not to commit ourselves to answer by applying the same name to both until more is known about the structure both of liquids and solids."

PHARMACY.

UROPHERIN BENZOATE.—A mixture of theobromin-lithium and benzoates of lithium; it is a white soluble powder which is used as a diuretic in doses of 1 gm.

SALIFORMIN (Hexamethylen-tetramin-salicylate).—A white crystalline powder, of pleasant acidulous taste, soluble in water. It acts as an antiseptic uric acid solvent in treatment of crystolithisis.

ARTHRITICIN.—A new compound of the formula



$$C_6H_4 < N < \overset{OC_2H_5}{N(CH_2), NH} \atop CH_2.NH_2,CO_1.$$

Probably intended as a remedy for gout.

QUININE-IODO-HYDRIODATE ($C_{20}H_{24}N_2O_2$. I. HI).—This forms a brown, insoluble powder, which has shown itself to be effectual in treatment of obstinate cases of intermittent fever and in secondary and tertiary syphilitic complications. Daily dose is 2.5 gm.

RAPID ESTIMATION OF CAFFEINE IN TEA OR COFFEE.—Delacour (Jour. de Pharm. et Chem.) directs the following: Two gm. of the tea or coffee are boiled for 10 minutes with 80 to 90 cc. of water; allow to cool; add 4 cc. of basic lead acetate solution, followed by sufficient water up to any definite volume; shake, filter, to 50 cc. of the filtrate add 10 to 15 drops of acetic acid, shake, by rotating, then extract four times with portions of 20 cc. each of chloroform. The chloroform extractions are collected in a flask, the volatile solvent removed by distillation, and the dry residue weighed.

CRYSOTOXIN.—A crystalline principle, isolated by Jacoby, which represents the activity of ergot. It is sold in form of chrysotoxin which is stable, also in the form of its sodium salt.

DETECTION OF SALICYLIC ACID IN BEER.—J. J. La Biere (Jr. Soc. Chem. Ind.) in examining the distillate from pale and dark beers, found in every case, especially in the dark beers, that a red-violet coloration was produced with ferric chloride, and although the reaction is weaker if the distillation be performed by the aid of a paraffin bath instead of over a naked flame, and if two drops of concentrated sulphuric acid have been previously added per 100 c.c. of beer taken, it cannot be entirely eliminated. This source of error can, however, be avoided by the use of Millon's reagent (1 cc. of mercury in 10 cc. of concentrated nitric acid) freshly prepared, two drops producing a decided rose-coloration in presence of as little as 1 part of salicylic acid in 500,000 parts of water. The addition of the sulphuric acid also facilitates the distillation of the salicylic acid. The red-violet coloration with ferric chloride is apparently due to the presence of maltol, which exists ready formed in torrefied malt and dark beers, and is probably also formed by the overheating, inevitable at the end of the distillation of the beer.

THE WORK OF PHYSICAL CHEMISTRY.—Prof. William A. Noyes, as vice-president for the Chemical Section of the American Association, opened his section with a very interesting and suggestive review and forecast of the achievements of physical chemistry. (Pop. Sci. Month.) Though the progress of this branch seems slow in comparison with what we may conceive as ultimately possible, notable advance has been made through the efforts of the numerous investigators who have been industriously working in it. Light has been cast upon many problems, and it is now possible to predict phenomena of which the operator could formerly have knowledge only by experiment. The older methods have given place to mathematical determinations, and new regions of investigation have been opened to chemists. We have still before us, however, the vast task of learning how to save and utilize the immense proportion of the power—far exceeding that which is saved—which now goes to waste in all our operations. To make good as large a part as possible of that which is now lost should be the object of future work in physical chemistry.

ACTION OF PARALDEHYDE ON IODINE COMPOUNDS.—On mixing paraldehyde with a solution of potassium iodide, Dr. Wochhausen (Ph. Ztg.) noticed that the solution turned brown from liberated iodine. On making comparative tests of the action of chlorine, nitrous acid, ferric chloride and potassium permanganate on alkali iodides the author found that paraldehyde was a far more delicate and characteristic reagent for the presence of iodine (combined) than either of the above. As is well known, some of the above reagents are very treacherous when applied in very dilute solution or used slightly in excess. The following table gives an estimate of the comparative value of the different reagents, employing starch paste and carbon disulphide as indicators of the presence of free iodine.

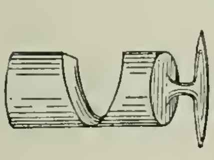
Potassium permanganate ..	1 : 10,000
Chlorine	1 : 100,000
Nitrous acid	1 : 200,000
Paraldehyde	1 : 500,000 to 1,000,000

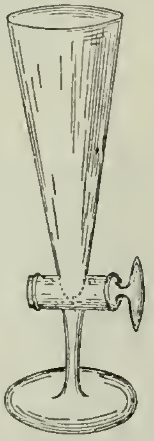
In testing very dilute solutions for iodine, the solution is first mixed with starch paste, then a few drops of paraldehyde added; according to the concentration a reddish to blue ring forms at the line of contact of the two fluids. If carbon disulphide is employed and the solution is very dilute, it will be necessary to agitate the same portion of the solvent with several portions of the solution to which the paraldehyde has been added.

PIPERIDIN GUAIACOLATE.—Obtained by action of piperidin on guaiacol in benzole solution. It crystallizes in needles or plates, is soluble in water 3.5 p. to 100 p., and is decomposed into its constituents by dilute acids or alkalies. Its pharmacological action depends upon its constituents, guaiacol being an antiseptic and piperidin a cardiac-vascular tonic. Recommended in phthisis in doses of 0.3 to 1.5 gm. three times daily.

VARYING RESULTS OF ANALYSIS.—It is not generally known that in chemical analyses different results, in many cases, are obtained by different chemists from the same substance. Thus, according to a paper read by F. P. Dewey, of Washington, D. C., before the American Institute of Mining Engineers (Sci. Amer.), this fact was illustrated, notably in a case of examination of gold and silver in copper materials—a case in which there were twenty-six results by twenty chemists, working by two main methods, each by a single chemist, varying from 135.38 to 122.88, and averaging 127.94 ounces per ton, the extreme variation being 12.5 ounces per ton, or 9.77 per cent. of the average determination. In the silver assay of the copper borings, nine chemists' reports by the scorification method averaged results varying from 164.35 to 154.40, the rate per ton running some 159.36 ounces, thus showing an extreme variation of 9.95 ounces per ton, or 6.24 per cent. of the average. Further, fifteen chemists' reports of sixteen results by combined wet and scorification methods varied from 161.40 to 148.50, averaging 156.48 ounces per ton, the extreme variation being 13.9 ounces per ton, or 8.88 per cent. of the average. Summing up, there are thus shown twenty-six determinations by twenty chemists, working by three methods, ranging from 164.35 to 148.5, and averaging 157.67 ounces per ton, the extreme variation being 15.85 ounces per ton, or 10.05 per cent. of the average determination.

A GLASS FOR COLLECTING SEDIMENTS.—The figure illustrates a novel method for collecting sediments, devised by Dr. Spaeth (Zeitschr. f. Angew. Chem.) The fluid from which the sediment is to be collected is placed in the tumbler with the stopcock, turned so that the edges of the cup-shaped cavity will correspond exactly to the sides of the glass; when sufficient of the sediment has collected in the cup of the stopcock it is slowly turned round until it is entirely closed against the fluid in the glass. The contents of the tumbler are then emptied out, the glass cleaned, and then the stopcock may be reversed and the sediment collected.





SOURCE OF AMERICAN CARBOLIC ACID.—That carbolic acid is made from "crude carbolic acid" is of course fully understood, but whence American manufacturers derive their raw material is not so well known, since illuminating gas is now no longer produced from coal, in our larger cities at least. A recent opinion rendered by General Appraiser Tichenor, of New York, throws some light on this subject. (W. Dr.) We learn that crude carbolic acid is imported from England by Harry W. Jayne, of Philadelphia, exclusively, and is used for manufacturing purposes only. The crude liquor is described as 60 or 70 or 80 degrees, meaning that a certain portion will crystallize at that temperature. The liquor is derived from the dead oils of coal-tar by agitation with an aqueous solution of sodium or potassium hydrate. It has approximately the following composition: Crude phenol, 62.74; crude cresol, 14.09; rosolic acid, hydrocarbons, naphthaline, and its dihydrid and tetrahydrid derivatives, bases, parvoline, coridine, rubidine, 12.13; water, 11.04. In this connection attention may be called to the fact that the crude carbolic acid of the market as sold to-day is not what it purports to be, and quite different from that of former times. Formerly crude carbolic acid was the liquor remaining after the extraction of the phenol, leaving water-insoluble but still valuable cresols. Since the latter have attained such great mercantile importance, however, they also are carefully removed from the liquor, leaving scarcely anything but stinking tars, absolutely worthless for disinfecting purposes. It is now necessary to order "crude cresol" to obtain an equivalent for the former crude carbolic acid.

MOLDABLE MASS.—For luting vessels made of glass, porcelain, etc., which are to be used to hold strong acids, a mixture of asbestos powder, water-glass and an indifferent powder (permanent white, sand, etc.) is recommended. Experiments which have been made in this direction have confirmed the reliability of the assertion. To begin with, asbestos powder was made into a pulp with three or four times the quantity (weight) of a solution of soda water-glass (of 30 degrees Baumé). The same is exceedingly fat and plastic, but is not very well suited for working, as it shrinks too much and cracks when drying. By an addition of fine writing sand of the same weight as the asbestos used, the mass can be made less fat, so as to obviate shrinking, without detracting from the plasticity. Small vessels were molded from it and dried in the air, to be tested afterward. Put in in water, the hardened mass becomes soft again and falls apart. Brought into contact, however, with very strong mineral acids, it becomes even firmer and withstands the liquid perfectly. Concentrated nitric acid was kept in such small vessels, without the mass being visibly attacked or anything penetrating it. The action of the acid manifestly has the effect that silicic acid is set free from the water-glass in excess, which clogs up the pores entirely and contributes to the lutation. Later on, the mass cannot be dissolved by pure water any more. Another experiment showed that the mass is also highly fireproof. One of the molded bodies was kept glowing in a Bunsen gas flame for about half a day after treatment with acid, without slagging in the least. For many purposes it ought to be welcome to have such a mass at hand. It cannot be kept ready for use, however, as it hardens a few hours after being prepared; if potash water-glass is used instead of the soda composition, this induration takes place still more quickly.—Painter's Magazine.

NICKEL PLATING OF WOOD.—The nickel plating of wood for various decorative uses, such as canes, umbrella handles, etc., is extensively practiced both in Europe and this country. The Electrical World gives the following description of the process: "The articles which are to be plated with nickel must first be coated with metal. In the process which is most commonly employed three solutions are made use of, namely: (a) 1½ grams of caoutchouc slicings are dissolved in 10 grams of carbon bisulphide and 4 grams of melted wax are poured into the solution; a mixture consisting of 5 grams phosphorus in 60 grams of carbon bisulphide, with 5 grams of turpentine and 4 grams of powdered asphalt, is then added and the whole shaken; (b) 2 grams of silver nitrate are dissolved in 600 grams of water; (c) 10 grams of chloride of gold are dissolved in 600 grams of water. The conducting wires are attached to the article, which, after being immersed in the first solution, is allowed to dry. The second solution is poured over it, and it is kept suspended until the surface has a dark luster, when it is rinsed with water and treated in a similar manner with the third solution. The surface has now a yellowish sheen, and the wood is sufficiently prepared for electrolytic deposition. Langbein's dry process consists in quickly pouring over the article a collodion solution of potassium iodide, diluted with an equal volume of ether-alcohol; when the layer is just about to set the wood is laid in a weak solution of silver nitrate, light being excluded. As soon as a yellow color appears the wood is rinsed, exposed to sunlight and covered with copper. It is then ready to be nickel plated. The wood may also be treated with immersion in an ethereal solution of paraffin or wax, and when the erher has evaporated fine graphite is powdered over it, or the wax is covered with bronze powder and all unevenness of surface removed. When the articles are to be electrolytically coated with copper they are placed in a bath the composition of which varies with the current employed; generally it consists of 30 liters of 18 per cent. copper sulphate solution and 1½ liters of 66 per cent. sulphuric acid. When a sufficient amount of copper is deposited the articles are ground, polished and nickel plated in a bath composed of 500 grams of ammonium nickelous sulphate. 50 grains of ammonium sulphate and 10 liters of distilled water. If the blue litmus paper be quickly reddened by this solution the acidity is reduced to such a point by addition of ammonium chloride that the reddening is only slowly developed.

THE EVOLUTION OF ASEPTIC SURGERY.—A part of the presidential address of Sir Joseph Lister at the British Association was devoted to the story of the development of the author's system of aseptic treatment of wounds. Pop. Sci. Monthly abstracts this address, which began with the publication of the results of Pasteur's researches on fermentation, by which it was proved that putrefaction was not produced by any chemical action of the atmosphere, but by germs. Sir Joseph then sought for some substance that would prevent the development of germs in the bodily tissues without harming the tissues themselves, and found it in carbolic acid. Diluted with water, this substance when applied quickly transferred itself to the tissues and attacked the germs. In cases to which the watery solution was not adapted, or where it was too irritating, a solution in some organic substance, not parting with the carbolic acid so readily, was found to be bland and unirritating, and served as a reliable store of the antiseptic. While continuing his experiments in confirmation of Pasteur's theory, Sir Joseph found that blood drawn with antiseptic precautions into sterilized vessels might remain free from microbes for an indefinite time, even when exposed to the access of air or with ordinary water added to it. He even found that if very putrid blood was largely diluted with sterilized water, so as to diffuse its microbes widely and wash them clean of their acrid products, a drop of such dilution added to pure blood might leave it unchanged for days at the temperature of the body, although a trace of the septic liquid undiluted caused intense putrefaction within twenty-four hours. Hence he was led to conclude that it was the grosser forms of septic mischief, rather than microbes in the attenuated condition in which they exist in the atmosphere, that were to be dreaded in surgical practice. He hinted to the London Medical Congress in 1881 that it might turn out possible to disregard the atmospheric dust altogether, but did not venture to practice upon the hint till 1890, when he brought forward, at the Berlin Congress, what he believed to be absolute demonstration of the harmlessness of atmospheric dust in surgical operations. "This conclusion has been justified by subsequent experience. The irritation of the wound by antiseptic irrigation and washing may therefore now be avoided, and nature left quite undisturbed to carry out her best methods of repair, while the surgeon may conduct his operations as simply as in former days, provided always that, deeply impressed with the tremendous importance of his object, and inspiring the same conviction in all his assistants, he vigilantly maintains from first to last, with a care that, once learned, becomes instinctive, but for the want of which nothing else can compensate, the use of the simple means which will suffice to exclude from the wound the coarser forms of septic impurity."

LIQUEFACTION OF GASES.— The liquefaction of gases in large quantities for scientific and technical purposes has become an important factor of late years, and considerable attention has been attracted to the experiments of Prof. Linde, who has devised an apparatus for the liquefaction of air and oxygen. The apparatus employed is shown in Figs. 1 and 2. The gas (air) to be liquefied is passed in at a (Fig. 1), and by means of the compressor c the pressure is increased from p_2 to p_1, from this it passes through the cooler R, where it acquires a temperature of t_1, then the compressed air passes into the spiral tube H, which consists of two tubes, one inside of the other; in the passage through this cooler the temperature of the gas is reduced to t_2; when it reaches r the temperature is still further reduced to t_3. From here the gas passes through the space between the two tubes in the spiral H back to the compressor c, in so doing the warm air passing through the inner tube of H is cooled to a temperature nearly equal to that of the current passing back through the outer tube. It is evident that in this way t_2 and t_3 must be constantly lowered until the efficacy of the apparatus, due to external influences, ceases. This state of equilibrium is not reached until, with the pressure existing in the apparatus, t_3 reaches such a low value that the liquefaction of the air takes place. The amount of time necessary to accomplish this depends upon the dimensions of the space between the two spiral tubes H. By a modification of this apparatus it is possible to separate by mechanical means two gases, for example oxygen and nitrogen, from the atmosphere. This method may be employed for obtaining large quantities of oxygen gas.

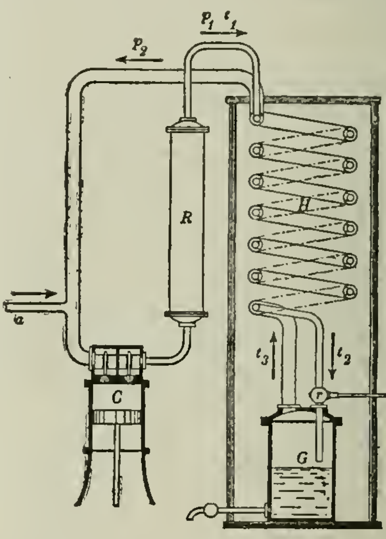


Fig. 1.

The principle is that two gases are liquefied about the same time, but on passing again into the gaseous state the more volatile gas passes into this condition first. In order that this idea may be successfully carried out, it is necessary that the low temperature employed in liquefying the gases should remain in the apparatus and that the gas that escapes should leave the apparatus at ordinary temperature. This may be carried out as illustrated in Fig. 2. The compressed air leaving the cooler passes through the tubes N and O, which branch off at a and join (inside tubes) again at b, so that the air passes through the cooled coil s and then into the receiver at r_1. The rise of temperature in the coil s causes the nitrogen to volatilize from the fluid passing into the receiver. The nitrogen passes through the outer tube n and cools off the current of air passing through the inner tube, leaving the apparatus at n. The liquid remaining in the receiver is now richer in oxygen, this rises in the outer tube o, volatilizes, and after cooling the current of air flowing through the inner tube leaves at o as nearly pure oxygen. The volume of oxygen evolved depends upon the regulation of the valve r_2, which governs the relation between the fluid in the receiver and the heating surface in the spiral tube s. Experiments proved that it was possible to separate 5 cc. of air (normal pressure and temperature) into oxygen and nitrogen in one hour per horse-power employed.

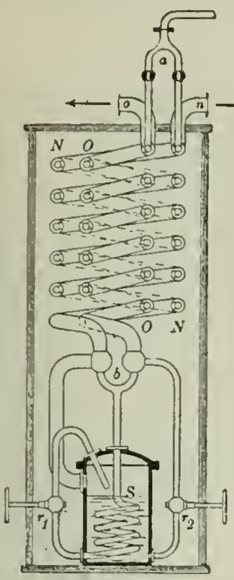
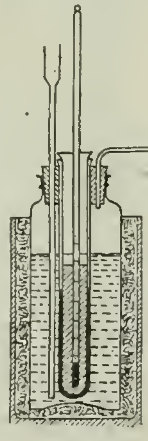


Fig. 2.

AN APPARATUS FOR GENERATING LOW TEMPERATURES.—J. Lewis (Chem. and Drug.) has devised a very convenient form of apparatus adapted for producing a low temperature by means of the rapid evaporation of ether, ammonia, etc. A wide-mouthed jar is placed in a container, the space around the jar being filled with oakum or any poor conductor of heat; the rubber stopper of the jar contains one large and two small perforations. Through one perforation a thistle tube passes, extending nearly to the bottom of the jar, which is filled about two-thirds full of ether or concentrated ammonia; a second short tube passes out from above the surface of the fluid and is attached to a water pump. In the larger opening a large test tube is placed, which serves as a mantle for another tube of slightly smaller diameter, which is placed inside and contains the fluid which is to be cooled or frozen. The air space between these two tubes is partly filled with mercury (as shown by the heavy line in the figure), which serves as a conductor between the two tubes and the cooling fluid in the jar. The pump is started, and it, drawing a current of air rapidly through the fluid, causes a lowering of temperature by the rapid evaporation; where ether (0.720) is employed as the cooling fluid, a temperature of — 21° C. is produced, with aqua ammonia (0.880) — 14° C., with petroleum ether — 10° C., and benzine + 2° C.



QUESTION BOX

The object of this department is to furnish our subscribers with reliable and tried formulas and to discuss questions relating to practical pharmacy, prescription work, dispensing difficulties, etc. Requests for information are not acknowledged by mail and ANONYMOUS COMMUNICATIONS RECEIVE NO ATTENTION.

Marsden's Cancer Paste.

(J. K.) See Era, Aug. 13, 1896.

Tan Shoe Polish.

(Enquirer). See this journal, Feb. 18, 1897, page 207.

Antipyretic and Analgesic Compound.

(H. R.) We cannot give the formula for the proprietary article you name.

Plant Identification.

(L. P.) The specimen you submit is a lichen—Sticta pulmonacea. An illustration, natural size (after Sachs), is given in Bessey's Botany.

Coloring Acid Elixirs.

(G. J. M. S.) Tincture of cudbear of the National Formulary (No. 418, revised edition) is very satisfacory for coloring acid liquids a bright red tint or color. If a brownish-red tint is desired use compound tincture of cudbear.

Buyers of Crude Drugs and Medicinal Plants.

(O. O. S. and C. G. S.) Most all large pharmaceutical houses and drug jobbers generally are buyers of crude drugs and medicinal plants. Both of you are in territory contiguous to this city and we suggest you correspond with houses here. Address McKesson & Robbins, Parke, Davis & Co., Schieffelin & Co., J. L. Hopkius & Co.

Pulverization by Intervention.

(W. S. C.) Pulverization by intervention or "mediation," as it is sometimes called, is the process of reducing substances to powder through the use of a foreign body which facilitates disintegration. Almost any work on practical pharmacy will give you information upon the subject.

Corn Collodion.

(F. W. U.) There is nothing you can add to corn collodion to prevent the evaporation of the ether. If the preparation is exposed to the atmosphere at all evaporation will take place. By securely corking the bottles with corks soaked in paraffin evaporation may be retarded. No other solvent is suitable for this preparation.

Books on the Manufacture of Artificial Mineral Waters.

(G. C. D.) The Era Formulary gives about as many different formulas for the manufacture of artificial mineral waters as any work with which we are acquainted. A work containing similar formulas is Smith's Carbonated Waters. If you wish to do a little formula constructing yourself, you can use to good advantage a bulletin issued by the U. S. Geological Survey on "Mineral Waters of the United States."

Burnishing Gold Leaf.

(B. & B.) Gold leaf after being laid on signs is usually burnished by passing over it a "burnisher" of agate, flint or other substance. Burnishers are made of various sizes to suit the kind of work. Dick gives this method of procedure: Allow the work covered with the gold leaf to dry about eight or ten hours, then dust the parts to be burnished with a soft brush, and, wiping the burnisher with a piece of soft wash leather (quite dry) begin to burnish about an inch or two in length at a time, taking care not to bear down too hard, but with a gentle and quick motion apply the tool till the gilding is equally bright all over.

Aqua Vitae; Hematis.

(E. J. H.) received this prescription:

Aqua vitæ	2 ounces
Hematis	1 ounce
Quicksilver	1 dram
Liquid storax	2 drams
Camphor	2 drams

Mix and use as directed.

What are the first two ingredients? The directions given afford no clue as to the use of the prescription. We presume, however, that by "aqua vitæ" is meant alcohol, although that name is applied as well to brandy, whisky, etc. We do not identify the second ingredient. Maybe some one of our readers can solve the problem?

Essence of Pepsin.

(G. N. T.) 1.) Pepsin (pure), 128 grains; dilute muriatic acid, 5 drops; simple elixir, 3 fluid ounces; glycerin, 1 fluid ounce; water, 16 fluid ounces; angelica wine, 6 fluid ounces. Dissolve by agitation and filter through purified talcum.

2.)	Glycerole of pepsin	3 parts
	Sherry wine	5 parts
	Glycerin	1 part
	Simple elixir, to make	16 parts
3.)	Pepsin in scales	64 grains
	Glycerin	1 fl. ounce
	Elixir taraxacum compound	1 fl. ounce
	Alcohol	2 fl. ounces
	Oil of cloves	1 drop
	Syrup	2 fl. ounces
	Dilute hydrochloric acid	1 fl. dram
	Water, to make	16 fl. ounces

Insolubility of Salicylic Acid.

(E. J.) was unable to effect complete solution in compounding this prescription:

Morphine sulphate	8 grains
Salicylic acid	4 grains
Distilled water, to	1 ounce

"On heating the mixture complete solution was effected, but on cooling, long, slender crystals were deposited. The addition of two drams of alcohol did not dissolve the crystals. The acid was added to prevent deterioration." Salicylic acid is comparatively insoluble in water at ordinary temperature (1 part in about 450, U. S. P.), and the crystals deposited were those of the acid in excess of that the water dissolved. To completely dissolve 4 grains of salicylic acid will require rather more than 4 fluid ounces of water.

Podophyllum Pills.

(J. K.) The best known formula under this title is probably "Squibb's Podophyllum Pills" of the National Formulary (No. 308, revised edition). Many other formulas for pills containing resin of podophyllum, or podophyllin, are extant. If you simply wish to make a pill containing nothing but podophyllin you can easily do so by using tincture of podophyllum as an excipient. It makes a more adhesive mass than alcohol alone. Podophyllin is a rather uncertain drug if the reports of many medical authorities are to be believed. It acts well in some cases, very slightly in others, and in a third class it causes much discomfort and griping. It is advisable, therefore, always to begin with small doses, combined with other ingredients which may restrain its irritating action.

Handbook of Medicinal Plants.

(O. O. S.) A small, yet authoritative, book along the lines you indicate is "The Medicinal Plants of Tennessee," by A. Gattinger, M. D., and published under the direction of the Commissioner of Agriculture of that State. This book treats of the commercial value of the medicinal plants of that region, and contains among other things an analytical key, descriptions to aid in recognizing such plants, notes relating to their distribution, time and mode of collection, preparation for the drug market, etc. This book, as stated, is arranged primarily for the plant and herb collector of Tennessee, but most of the general information will apply equally well to your neighborhood. We believe copies of it may be obtained from the State printer, Franc M. Paul, Nashville, for 50 cents. We know of no similar work.

Importation of Books.

(G. C. D.) Paragraph 410 of the Tariff Act of Aug. 1, 1894, provides that books bound or unbound, which shall have been printed more than twenty years at the date of importation, and scientific books devoted to original scientific research, and publications issued for their subscribers by scientific and literary associations or academies, or publications of individuals for gratuitous private circulation, and public documents issued by foreign governments, when imported, shall be exempt from duty. Section 411 of the same act provides that books and pamphlets printed exclusively in languages other than English may be imported free of duty. Books for public libraries may also be imported free of duty, but all other books not specially provided for in the tariff act are subject to a duty of 25 per centum ad valorem. (Section 311.)

Iron Pyrophosphate and Phosphoric Acid.

(J. B. F.) has had difficulty with this prescription:

Iron pyrophosphate	1 dram
Water, enough to dissolve.	
Tincture nux vomica	5 drams
Dilute phosphoric acid	2 drams
Elixir calisaya, enough to make	4 ounces

He says he tried metaphosphoric acid without success. J. B. F. seems to be aware of the incompatibility of iron pyrophosphate and dilute phosphoric acid, a reaction which was discussed in this journal, Feb. 11, 1897, page 174. We are inclined to the belief, however, that he has used an elixir of calisaya which has not been detannated, and it, therefore, is the cause of his difficulty. He will have no trouble if he will use, as suggested, dilute metaphosphoric acid and detannated elixir of calisaya (N. F.), instead of the dilute phosphoric acid and elixir of calisaya as here ordered.

Asthma Relief.

(D. R.) wants to know if the last two articles cannot be omitted from the following "asthma relief":

Mullein leaves	4 parts
Cubeb berries	4 parts
Sassafras bark	2 parts
Chamomile flowers	4 parts
Saltpeter	8 parts
Stramonium leaves	4 parts
Potassium chlorate	1 part
White sugar	2 parts

Presumably this powder is to be ignited and the vapor inhaled, and we should by all means omit the last two ingredients. They add but little to the therapeutic value of the "relief" and they are a source of danger. Potassium chlorate and sugar should never be combined in the dry form. They may cause an explosion. Stramonium and belladonna leaves with saltpeter constitute the principal parts of the asthma remedies used by igniting and inhaling the smoke.

Hair Invigorator.

(R. P. C.) wants to perfume the following hair restorer:

Lead acetate	3 parts
Flowers of sulphur	2 parts
Glycerin	14 parts
Water	80 parts

He could not combine oil of bergamot with the mixture, nor could he secure a satisfactory suspension of the sulphur. What shall he do? Make a saturated aqueous solution of oil of bergamot (if that odor be the one desired) after the general official process for medicated waters, using about 2 parts of the oil to 1,000 of water. In this dissolve the lead acetate. Instead of flowers of sulphur use precipitated sulphur, as it is much to be preferred to the other forms in liquid mixtures; the particles are lighter and more easily suspended. Triturate the precipitated sulphur with the glycerin and gradually add the perfumed solution of lead acetate. If preferred, rose water may be substituted for water or bergamot water in the above. We find this method of procedure very satistory.

Interstate Registration and "Diploma" Registration.

(C. W. S.) We do not think that certificates of the New York State Board of Pharmacy are recognized by the boards of pharmacy in other States, as the New York board does not recognize the registration of others. A list of the States which do re-register on this basis is given on page 466, May 15, 1894, Era. However, it is suggested you write to secretary of particular board concerning which you desire information and get it at first hands. Boards of pharmacy in Arkansas, Colorado, California, District of Columbia, Delaware, Florida, Illinois, Louisiana, Maine, Maryland, Minnesota, Nebraska, New Mexico, New York, North Carolina, North Dakota, Oklahoma, Oregon, South Dakota, Texas, Utah, Virginia, Washington, West Virginia and Wisconsin are allowed to register graduates holding diplomas from regularly incorporated colleges or schools of pharmacy, and who have had a certain amount of practical experience (from two to four years) before receiving such diplomas. The Kentucky board is allowed to register graduates of any school or college of pharmacy incorporated in that State. In Maine, besides being a graduate, the candidate must prove himself to be competent for the business.

Show Globe Colors.

(F. L. & E. G. F.)

Orange.

Make a solution of bichromate of potash in water, and darken with sulphuric acid.

Dark Green.

Dissolve 8 ounces of sulphate of copper and 40 grains (or quantity sufficient) of potassium bichromate in two gallons of water.

Red.

Distilled water	970 parts
Sulphuric acid	20 parts
Cochineal	6 parts
Bitartrate of potassium	4 parts

Purple.

1.)	Sugar lead	3 ounces
	Powdered cochineal	1 dram
	Water, q. s.	
2.)	Salicylic acid	1 grain
	Alcohol	2 drams
	Tincture of iron	5 drops
	Water, sufficient.	

Dissolve the acid in the alcohol; to it add first, the tincture, and then enough water to produce the desired color.

Liquid Glue for Wood.

(O. O. S.) The Era Formulary is authority for these:

1.) Fill a jar or bottle with small pieces of glue, and cover with acetic acid. Then place in a vessel of hot water for several hours, until all the glue is dissolved.

2.) A solution of 8 ounces of glue in ½ pint of water is made. To this add 2½ ounces strong nitric acid, stirring all the while. Effervescence will take place with the evolution of orange nitrous fumes. When all the acid has been added, the liquid is allowed to cool. Kept in a well-stoppered bottle, it will remain permanently liquid.

3.)	Acetic acid	4 ounces
	White glue	3 ounces
	French gelatin	4 drams
	Shellac varnish	4 fl. drams
	Distilled water	4 ounces

Dissolve the glue in the acid with heat, and the gelatin in water with heat. Mix the two solutions gradually until homogeneous, then add the varnish, and put into bottles.

Waterproof.

4.) Boil for ten minutes a mixture of

Thick solution of glue	10 parts
Linseed oil varnish	5 parts
Litharge	1 part

and use the compound while hot.

Preserving Eggs.

(J. K.) Marsh dissolves in each gallon of water 12 ounces of quicklime, 6 ounces of common salt, 1 dram of soda, ½ dram saltpeter, ½ dram tartar and 1½ drams of borax. The fluid is brought into a barrel and sufficient quicklime to cover the bottom is then poured in. Upon this is placed a layer of eggs, quicklime is again thrown in and so on until the barrel is filled so that the liquor stands about 10 inches deep over the last layer of eggs. The barrel is then covered with a cloth, upon which is scattered some lime.

(2). A French authority gives the following: Melt 4 ounces of clear beeswax in a porcelain dish over a gentle fire and stir in 8 ounces of olive oil. Let the solution of wax in oil cool somewhat, then dip the fresh eggs one by one into it so as to coat every part of the shell. A momentary dip is sufficient, all excess of the mixture being wiped off with a cotton cloth. The oil is absorbed in the shell, the wax hermetically closing all the pores. It is claimed that eggs thus treated and packed away in powdered charcoal in a cool place have been found after two years as fresh and palatable as when newly laid.

(3). The Cyclopedia of Receipts says that water glass or silicate of sodium has recently been used in Germany for rendering the shells of eggs non-porous. A small quantity of the clear syrupy solution is smeared over the entire surface of the shell. On drying, a thin, hard, glassy film remains, which serves as an admirable protection and substitute for wax, oils, gums, etc.

Trade-Marks and Label Copyright.

(W. L. M.) Trade-marks are registered at the Patent Office, Washington, D. C. The United States law provides that any firm or corporation may secure an exclusive right to use a trade-mark by complying with the official regulations of the Patent Office. The special advantage of registration is that it facilitates the pursuit and stoppage of infringements by authority of the government. A trade-mark consists of a distinctive or special name or title for an article, or a device, design or stamp, or combination thereof, applied to merchandise, or the envelopes or packages. The mere business name of a person is not registerable as a trade-mark, nor can words that are merely descriptive of the article be registered as trade-marks. In other words, you may select as your trade-mark any non-descriptive word or words, picture, figure, autograph, monogram, or a combination of any or all of these, provided the same has not been used on a similar class of goods. Trade-marks remain in force thirty years, and may be renewed for thirty years more. The government fee for registering a trade-mark is $25; the fee for registering a print or label, $6. The trade-mark must have been adopted before an application for registration should be made, and the date of adoption is the date when the labels containing the trade-mark are applied to the goods. A trade-mark cannot be registered unless it is already in use in trade with one or more foreign countries, or an Indian tribe, but this provision is usually complied with by sending a few samples of the goods, with the trade-mark affixed, to any merchant or dealer in Canada. Certain official rules of the Patent Office must be observed in making application for registration of trade-marks. You can obtain full information from the Commissioner of Patents, Washington, D. C., who will send you, upon application, the necessary blanks, etc. For information regarding label registration see March 19, 1896, Era, page 364.

Cement for China Ware, Glass, etc.

(O. O. S.) Try one of the following:

(1). English Cement for Porcelain.—Soak 1 dram of isinglass in water; pour upon this a sufficient quantity of alcohol to cover the isinglass, and allow it to dissolve, placing it in a warm room. Next dissolve ½ dram of mastic in 1 fluid dram of rectified spirit of wine; mix both solutions together, add ½ dram of powdered gum ammoniac, and evaporate the mixture in a water bath until it has acquired the requisite consistency. Keep the cement in a glass bottle, and when it is to be used place the bottle in hot water, when the cement will become soft so that it can be conveniently applied to the fragments of porcelain to be cemented, which should be previously heated.

(2). Milk is coagulated by means of acetic acid, and the caseine thus formed is well washed in water, and then dissolved in a cold saturated solution of borax; a clear solution is thus obtained, which is superior to gum arabic in adhesive power, and is colorless. For porcelain, this liquid is mixed with finely powdered quicklime, and the resulting cement is quickly brushed over the fractured surfaces, which are then bound together; the ware is then dried to a gentle heat.

(3.) To resist heat. It is made of Stourbridge clay mixed with a little tow or asbestos to increase its coherence. It should be well beaten before application; the glass or china should be well rubbed over with a little of the cement mixed with water, taking care to press the two edges of the glass or china together. This cement will bear a very strong heat.

Crushed Fruits.

(W. A. S. S.) To prepare crushed fruits for the soda fountain one method is to heat the fruit in a clean copper kettle, then to cook 1 pound or less of sugar to crack degree, according to the quantity of fruit used. Stir the fruits in the boiled sugar, let it boil up again and fill in glass or earthenware jars; cover with wax paper and tie the paper over the jars to keep out dust. This fruit will keep very well in a cool place. Should the fruits be very watery, then it will be better to evaporate them a little over a slow fire; then mix with the sugar and finish as above.

Some time ago the Confectioners' Journal recommended the following processes: Crushed Pineapples—Take ripe pineapples; cut them in four or six pieces and run them through a cider mill; press; strain through a fine sieve; put in strong bottles; cork with new corks; tie the bottles crosswise with strong twine. Have a wooden lid ready, which provide with about a dozen holes; lay it on the bottom of a copper kettle or in a steam-jacket kettle; stand the bottles on a board; fill the kettle with cold water so it will reach up to the necks of the bottles; set on the fire and let the water come to a boil by slow heat; let the water boil about thirty to thirty-five minutes; remove the kettle from the fire and let the bottles cool off. When the fruits are all used up dip the neck of each bottle in melted sealing wax and store away in a dry and cool place.

Crushed Strawberries—Mash the berries, either by hand or by running them through a cocoanut grater; press out all the juice and proceed as above. This juice is generally used for soda water. Sweeten when ready for use to suit taste.

Sponges.

(E. I. S.) wants some information about sponges—a list of the different kinds, their habitat and values. He says this question was recently asked by the board of pharmacy.

Volumes have been written upon the natural history of the sponge, and if our correspondent wishes to go into this subject very thoroughly we suggest he consult the reference works in his city (Boston) library. As a "starter" he will do well to read the very comprehensive article on sponges in the last edition of the Encyclopædia Britannica, where is also given quite an extended bibliography of the subject.

The sponge, familiar in its commercial form, is practically the skeleton or fibrous framework of an animal belonging to one of the lowest orders living in the water. Described scientifically the sponge "is composed of amœbiform bodies disposed about a common cavity with one or more breathing orifices, through which water flows in and out." The fibrous framework from which the gelatinous or living matter has been removed is, of course, the part used. The sponge is very widely distributed, being found in both salt and fresh water. Many genera and species are cosmopolitan, and so are most orders.

There are several classifications adopted by dealers, each dealer, however, being guided to some extent by his individual opinion and ideas as to the arrangement of his catalogue. In response to a request for a commercial classification of this character, McKesson & Robbins furnish the following: Florida, Cuba, Nassau, Mediterranean, Turkish, Zimmoca, etc. These are again subdivided into different classes. Thus under "Florida" may be found sheep's wool, velvet, grass, yellow. About the same sub-divisions are given under "Cuba" and "Nassau." "Mediterranean" sponges (bath or honeycomb) are listed as those for barbers' use, toilet, bath, bath coupe and surgeons' sponges. Sponges are also prepared for various industries, potters requiring a very fine grade for their use. Shoe manufacturers are large consumers of sponges. If you desire to form a correct estimate of the commercial values of the various kinds of sponges, we suggest you secure a catalogue of some reputable house dealing in them, and give the subject a thorough study.

Copy Paste (Hectograph Composition) and Inks.

(J. A. H.)

1.) Thin French glue	1 pound
Glycerin	2 pounds
Precipitated chalk	2 ounces
Carbolic acid	1 ounce

Soak the glue one hour, drain, add the glycerin, and dissolve by heat. When nearly thick add the chalk and carbolic acid.

2.) Nelson's gelatin	3 ounces
Cut small and soak twelve hours in	
Water	4 ounces
Then add	
Glycerin	40 ounces

Heat gently until dissolved.

Here is a formula used by the French Ministry of Public Works:

Glue	100 parts
Glycerin	500 parts
Kaolin or barium sulphate, finely powdered	25 parts
Water	375 parts

For ink a concentrated solution of Paris violet is recommended. To remove old copy from the pad a little muriatic acid is added to the water.

For a tin dish 7 by 11 inches about the following quantities of the above formula will be required:

Glue	3 ounces
Glycerin	15 ounces
Kaolin	¾ ounce
Water	11¼ ounces

Here are some additional formulas for inks:

1.) Diamond fuchsine	10 parts
Alcohol	10 parts
Acetic acid	2½ parts
Gum arabic	10 parts
Water	70 parts

2.) Aniline blue, water soluble	10 parts
Picric acid	10 parts
Alcohol, 90 per cent	30 parts

3.) Rosaniline acetate	2 parts
Alcohol	4 parts
Water	20 parts
Glycerin	1 part

4.) Villon's Formula:

Bordeaux red	3 parts
Alcohol	2 parts
Water	20 parts
Glycerin	1 part

THE PHARMACEUTICAL ERA

[*WEEKLY.*]

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The "Era Binder," 75 cents per copy, post paid. To foreign countries, $1.00.

The Excise Drag Net.

The probability of a material reduction in the excise licenses which pharmacists in New York State are required to take out in order to sell alcohol will give satisfaction to the trade. But this satisfaction will be partly eclipsed by the additional information contained in our news columns this week that evidence has been quietly secured against nearly every unlicensed druggist in the State for selling alcohol, and that this evidence is to be used as a means of compelling these druggists to take out licenses for the unexpired balance of the excise year, ending April 30. In New York City these licenses will be issued at the rate of $8.33 a month, and the threat is freely made that any druggist who neglects to put up his $16.66 will be prosecuted by the department for the full amount of his year's license with costs.

Considering the facts that the former excise law permitted druggists to sell alcohol without a license, that the present law has been construed by at least one official and many unofficial authorities to grant the same privilege, and that the excise law has no business to interfere with any business not dealing in alcohol for internal use, the method of Commissioner Lyman in forcing this money out of the drug trade is certainly open to criticism. The Commissioner has adopted the put-up-or-shut-up tone of the saloon politician. He admits he could never secure a conviction on a criminal charge before a disinterested jury, it is said, but he proposes to sue civilly, and most druggists would rather pay $16.66 than be haled into court and compelled to hire a lawyer. This really seems the cheapest way out of it.

New and Proposed Pharmacy Legislation.

There seems to be considerable legislation recently affecting druggists in one way or another. This legislation is in both the proposed and the accomplished categories. There is an unusually large crop of propositions relating to the sale of poisons and liquors and the refilling of prescriptions for narcotics and opiates.

The proposed pharmacy legislation for this State at large and that which (embodied in the charter for the Greater New York) affects druggists of this city in particular are duly discussed elsewhere. Whether there is to be a new State law here is a question which the future will decide. Of other State legislation the most noteworthy is that which it was confidently expected would be secured in Indiana. That State hoped it could no longer claim the proud (?) distinction of being about the only State in the Union without a pharmacy la
(though Texas and Maryland have only half-way me
ures yet). The Indiana bill passed both houses
Legislature, but, sad to relate, the Governor v
three or four days ago. In the main, this propos
differed from those in force in other Stat
quite significant difference, however, was in
vision that all the appointments were to be
the Governor from "pharmacists approved b
ana Pharmaceutical Association, *or from otl*
cists." This sop was evidently offered i
Indiana's chief executive might not be ca
fix as that in which his brother Governor
recently found himself, but was to be le
pleases. Reregistration every two year

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Correspondence.

We are pleased to publish here communications from our readers on topics of interest to the drug trade. Writers are requested to express their views as briefly as possible. Each article must be signed by its writer, but his name will not be published if so requested.

Causes of the Substitution and Cut-Rate Evil.

Louisville, Ky., March 8, 1897.

To the Editor: I have read your article in the issue of the 4th inst., on "The Substitution Problem," and I feel that you have voiced the sentiments of fully 90 per cent. of the retail trade. As you very justly say, this fight is not one of our making we did not seek it—the proprietors have thrown down the gauntlet and said to the unpecunious retailer, "You will have to sell our goods at any price you can get for them, or sell nothing." In vulgar language, this is all "played out." The retailer is protecting himself in every instance that is possible. We do not propose to put our money in patent medicines for the privilege of selling them at just what they cost. Several of the more prominent dealers in this city have not only suggested, but have promised, to throw out of stock entirely all proprietary medicines sold to cut-rate and department stores direct. The retail trade is becoming thoroughly aroused to the unjust war that the proprietors have forced upon it. I know personally of several stores that have put in stock full lines of "non-secrets" and preparations of their own manufacture that never thought of handling anything but the products of the large proprietary concerns. I for one rejoice that the fight is on, and hope that every retailer will feel that the fight is his own and bend every energy that he may possess, and every influence that he can command, to combat the patent medicine business with preparations of his own manufacture. In this city the non-secret men have had a harvest for fully a year, as prior to December, 1895, there were no "cut rate" stores of any kind, even the dry goods business had agreed with the druggist to discontinue handling any patent medicines, and arranged a mutual and agreed scale for prices on many toilet articles. Everything worked smoothly here, notwithstanding there were "cut rate" druggists in some of the surrounding towns. But for the last year all profits have been annihilated, some of the patents being sold below the cost price—even of the manufacturers' very best price in any quantity. Does the proprietor think that the retailer is going to waste his valuable time in selling goods at prices that I have indicated? Not much. He will sell something that he can at least make a living profit on, or he will not sell at all. But the pharmacists of this country are a live, wide-awake and intelligent class of people. They have influence, and when they do determine to use it, it will be felt. Then let the proprietor who has forsaken his best friends, who has neglected and obstructed the proper and natural outlet for his goods—then let him turn to his department store friend, who will give him a "stone" instead of "bread." Let the retailer wage the war vigorously; let him put in stock and sell goods that he knows to be reliable beyond question; let him use every means that he honorably can to discourage and prevent the sales of their patent nostrums, until such time as the proprietor consents to give that aid and assistance to his legitimate friends that they are entitled to. Every one knows that the department and cut-rate shops use the cost prices on patents simply as a "blind." They feel satisfied that if they can only get the people into their stores they can "fleece" them on something else, for as one of these "cut rate" dealers told me, he lost one cent on a cake of soap, but he sold the same customer a 60-cent hair brush for one dollar. This is the animus of all such dealers. I hope you will keep after them, for you will certainly have the good will and assistance of almost the entire fraternity. Yours respectfully,

"ANGELINE."

* * *

Kansas City, Kan., March 5, 1897.

To the Editor: I inclose a clipping [embodying an editorial in the Era, Dec. 31, 1896] from the Kansas City Star, of March 2, which is apparently going the rounds of the secular press of this country as news matter (?), but which to a man up a tree can readily be seen in its true light, that of a paid advertisement of the patent medicine manufacturers! But, ye gods and little fishes! "Upon what meat doth this our Cæsar feed that he hath grown so great?" "Why man, he doth bestride the narrow world like a Colossus, and we petty men should walk under his huge legs and peep about to find ourselves dishonorable graves." These nostrum venders evidently are not satisfied to let the public sit in judgment upon the righteousness of their cause by giving a truthful statement of the facts, but must of needs garble and misconstrue an editorial published upon an entirely different and perfectly proper subject, "Substitution in Prescriptions."

The proprietors of these highly advertised fakes, all of which would die a natural death within a year should they attempt to live strictly upon their merits instead of hundred-thousand-dollar advertising contracts, evidently have no need of "nerve cures" themselves, although they give us "that tired feeling" when they attempt to dictate to the retail trade how to conduct their business with one breath, and the next quietly tell them to "go tell their troubles to a policeman," should they complain at being compelled to sell these great "Cure all the ills that flesh is heir to" at and even below cost to meet the competition of department and "cut-rate" drug stores.

That the furnishing of supplies in large quantities and at bottom prices to these cutters has acted as a boomerang, the proprietors have no one to blame but themselves. Self-preservation is of necessity the first law of human nature, and we are but human. The manufacturers should study the Golden Rule, and I am certain the retail trade will "tote" fair. Respectfully,

J. W. GIESBURG.

P. S. Since writing the above I have read with pleasure, as have doubtless thousands of your other readers, your able editorial upon the Substitution Problem, in your March 4 issue, and I heartily agree with you that the patent medicine men could easily stop the supply to other than legitimate dealers. We are obliged to cut in this city in self-defense, as you will see by inclosed circular.

J. W. G.

Cheap Goods and Cheap Prices.

To the Editor: Your article entitled "Cheap Prices" is much appreciated. It certainly voices the sentiment of all with whom we come in contact, and you certainly deserve credit for the feeling you have aroused; and permit me, in behalf of a great number of Western druggists, to enter a protest against 5 and 10 cent packages, especially of "patent medicines," a class of goods that are bought, not because they are cheap, but from the hope and belief that they will benefit.

The same amount of labor, time and skill is required to sell a 5-cent or 10-cent package as for a 50-cent or $1 package, and as the latter affords a much larger aggregate profit, all druggists with the ordinary amount of business sense will discriminate against the maker of nickel and dime packages.

Much injury is done the manufacturer of 5 and 10 cent packages, owing to the short trial they afford. The consumer will either not benefit at all or only slightly from the small package, and concludes that the remedy is not adapted to his case or is no good, whereas if a 50 cent or $1 package had been bought, ten times as long a trial would be made before passing on its merits. The 5-cent quantity brings condemnation. The 50 cent or $1 package benefits, and so proves a most effective advertisement, besides paying in one transaction a living aggregate profit to the druggist.

Of the dozen or more best selling and most popular patents not one has a cheap package and I would suggest to manufacturers who court meritorial success to follow their example. Let peanut venders content themselves with 5 cent and 10 cent sales, but the druggist who has a laudable pride in his profession will discriminate against them. Respectfully yours,

WALLACE.

NEURALGIN.—A mixture of antifebrin, sodium salicylate and caffeine.

ALLYL SULPHIDE AS SOLVENT FOR IODOFORM.—Owing to the ready solubility of iodoform in allyl-sulphide Allegre (Sem. Med.) proposes to employ this solution for hypodermic use in treatment of lung diseases. The allyl sulphide is readily absorbed by the tissues, leaving the iodoform behind in a finely subdivided condition, in which it is slowly taken up into the system.

SEPARATION OF STRYCHNINE AND BRUCINE.—G. Sander (Apoth. Ztg.) employs potassium permanganate for destroying the brucine, leaving the strychnine unchanged. Of the alkaloidal mixture, 0.2 gm. are dissolved in sufficient (10 per cent.) dilute sulphuric acid in a beaker, to this is slowly added a solution of 2 gm. of potassium permanganate in 100 gm. of 10 per cent. sulphuric acid; the solution is then transferred to a separating funnel, made alkaline with ammonia and shaken for 10 minutes with a mixture of 20 gm. of chloroform and 30 gm. of ether. The clear ether-chloroformic solution is filtered into a tared flask, the solvent distilled off and the residual strychnine weighed. The total alkaloids from nux vomica contain 43.9 to 45.6 per cent. of strychnine.

THE LIMITATIONS OF STANDARDIZATION.*

Wherever medicinal action obtains with a vegetable drug the soluble principles of the latter are the therapeutically active ones, and while all the soluble principles are not necessarily of therapeutic worth, it is impossible, in the immature condition of rational therapeutics as to the relative values of different drug extractives, to say that any given extractive is inert or without medicinal activity. Clinical evidence, and not chemical, determines the actual therapeutic worth of a drug and its preparations. The action of a drug, in modifying the contents of a diseased tissue, modifies one or all three cellular activities, nutritive, functional and reproductive. The functional activities, being the most obvious, have been the most studied by therapeutists. Indeed, the modern description of drug action is almost wholly limited to a description of the functional disturbances caused by its use. And yet, what is as important, the modifying influence of drugs upon the nutritive and reproductive activities of cells in disease, has received relatively little attention. Until this be done, no complete knowledge can be had of drug action in human tissues.

Many of the larger manufacturers lay great stress upon the fact that the more poisonous fluid extracts made by them have been standardized to contain a given amount of so-called active principle, and one might infer from the claims made for such fluid extracts that these principles represented the entire therapeutic activities of drugs. No claim could be further from the truth. The so-called active principles of a drug represent their individual therapeutic actions only, and nothing more. The entire therapeutic effects of a drug can only be had from the drug itself, or a preparation containing all the therapeutically active principles of the drug. Hence, from a therapeutical point of view, for example, aconitine, digitalin, strychnine, brucine and quinine represent their individual actions only, and not the therapeutic actions of all the constituents found with them. The proportion of the so-called active principle is no index of the proportion of the other proximate constituents of the drug. As a rule, the content of alkaloid is simply an indication of the amount of that proximate principle of the drug which produces the greatest functional disturbance in cellular tissues.

The value of standardized fluid extracts over those not standardized, in actual medical practice, has been much exaggerated. The fluid extracts that are usually standardized by the manufacturers, and not by the Pharmacopœia, are those of aconite root, belladonna leaves, coca, colchicum root, colchicum seed, conium fruit, digitalis leaves, gelsemium, hyoscyamus and the like. When the physician exhibits these fluid extracts clinically, what does he do? He gives the preparation in small and gradually increasing doses, until he gets full physiological effects, and then he stops the drug. Now, what practical difference to the physician does a slight variation in the proportion of the so-called active principle make?—especially in view of the fact that, with the possible exception of preparations of cinchona, nux vomica, opium and one or two others, every manufacturer is a law unto himself regarding the standard of strength adopted, and the manner of following that standard, which is fully as important as the matter. True, many manufacturers apparently adopt the same standard, but they reserve for themselves the right of using what working details of assay they wish. In the immature condition of drug assay it is well known that variable results are obtainable with many drugs with the same process as worked by different persons, due, probably, in some cases, to the difficulty of getting the final products pure.

Scores of modifications in the working details of processes of drug assay have been recommended in the last few years in the pharmaceutical prints, many of them from the laboratories of manufacturers. It is obvious that, in the opinion of their authors, these changes must have been improvements, or they would not have been recommended, and they have probably been adopted by some firms. But, in the absence of any general agreement, it is hardly reasonable to believe that all recommendations for changes in processes of assays have been adopted by manufacturers, and thus we may have the same processes in use by different manufacturers with varying modifications in working details, and, of course, yielding variable results. Until manufacturers of fluid extracts not standardized by the Pharmacopœia, but standardized by themselves, get together and agree upon the working details of their processes of assay, the commercial standardized fluid extracts will not be uniform in content of active principles.

As it is not practicable for the average physician to specify, in his prescriptions, the make of one particular manufacturer, nor practicable for the retail pharmacist to keep all makes of standardized fluid extracts, it is idle to over-estimate their importance.

Perhaps the strongest example of standardization run mad is to be found in the commercial attempts made to standardize fluid extract of digitalis. Here is a drug for which no practicable method of assay has yet been found, even with years of chemical research. This does not deter manufacturers. They simply assume certain standards of extractive, and claim that the drug is standardized, despite the fact that the percentage of extractive varies with the alcoholic strength of menstruum used to exhaust the drug, and the extractive may contain some or but little of the active principles, or it may contain none. One manufacturer markets his fluid extract of digitalis, and says that his standard is 20 per cent. extractive (strength of menstruum not given); another has as his standard fully 25 per cent., with a 75 per cent. alcoholic menstruum; another has as a standard 30 per cent. (strength of menstruum not given). Here is a difference in extreme limits of 50 per cent. between the strongest and the weakest extractives, and the difference is more than this if the first-named and the last-named fluid extract have had used for their making weakly alcoholic menstrua.

Now, what happens? The retail druggist may have prescriptions calling for all these makes of this fluid extract. Suppose that he makes his tincture extemporaneously from the fluid extract. One day a prescription for the tincture may be made from the 20 per cent. product, the next day from the 30 per cent. product, and the next day from the 25 per cent. product. Is there uniformity in this? And would a tincture made from good selected digitalis leaf, by the retail pharmacist himself, vary as greatly as these commercial fluid extracts, diluted with alcohol and water?

While an exaggeration of the value of drug assay is to be deprecated, it is equally unjust to ignore its growing importance. A great amount of valuable work has been done in recent years, but far more remains to be done, especially with regard to the clinical value of different proximate principles of plants in disease treatment.

PAPER WHICH IS PROOF AGAINST THE ACTION OF WATER, AIR, GREASE, AND WEAK ACIDS.—A. Zimmermann, London, has taken out an English patent, according to which parchment paper is drawn through a 2 to 3 per cent. solution of pyroxylin in ether-alcohol or other solvent. The film left by evaporation is firmly united to such paper, whereas from ordinary paper water detaches it easily. If the parchment paper be first treated with a 3 to 5 per cent. solution of cuprammonium, a successful result is certain, even if the paper be very stout and hard.

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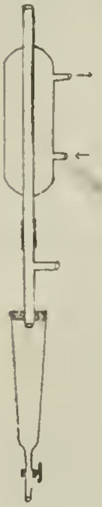
*The Alumni Report.

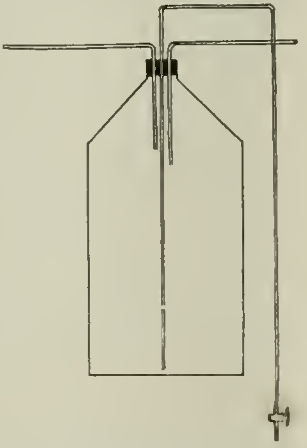
A Simple Laboratory Device for the Recovery of Volatile Substances.

By C. Gundlich, Ph. G., Ph. D., and J. Lesinsky, Ph. B.



Having had occasion to use large quantities of low boiling solvents we found the piece of apparatus pictured here invaluable for the immediate recovery of the same. As the drawing shows, we connected a long upright condenser with a common percolator, such as is used in pharmaceutical work, and attached to the bottom of the percolator a stop-cock. Between the percolator and the condenser a T-tube is fastened by means of rubber attachment, and all distillations are made into the open part of the T-tube. After the distillation is completed, it is advisable to wait a few seconds before drawing off the solvent at the bottom of the percolator. The advantage of this apparatus is that it is at once ready for use and occupies a very small space.

A Device for Use in Laboratories Supplied with Steam.



In distillations made with steam it is sometimes difficult to have the latter perfectly dry, as the steam is apt to condense more or less in the apparatus. To avoid this the following apparatus is to be recommended. As the steam comes from the boiler it is forced into an ordinary ether can which is fitted with a rubber stopper with three holes. Into one of the holes a glass tube is inserted reaching to the bottom of the can and closed outside with a pinch-cock. In order to start the apparatus the pinch-cock is opened and the condensed water is let off slowly so that a perfectly dry steam is now available. By regulating the flow of the condensed water by means of the pinch-cock the pressure of the dry steam is increased or diminished.

AN UNDESIRABLE REMEDY.—The following paragraph is at present going the rounds of the medical and pharmaceutical press:

Tellurate of Sodium.—Ten to twenty centigrams, and alcohol fifty grams, make a solution of which a teaspoonful may be given in sweetened water morning and night in the night sweats of phthisis. Dr. Joguet says: "It was successful in sixteen out of twenty cases."—Lyon Med.

The result of this medication does not seem to be generally known. Tellurium salts, while doubtless efficacious, have the peculiar property of decomposing in the system with formation of telluretted hydrogen which gives to the patient's breath an odor compared to which that of a cheap Spanish restaurant is grateful and comforting. The odor from the patient will render an ordinary room uninhabitable, even by those to whom the odor of onions or garlic is not necessarily unpleasant. The same odor is sometimes noticeable in patients who have taken large amounts of bismuth, these salts often containing traces of tellurium.—Drug Topics.

LEMON ESSENCE (Artificial).—Diluted alcohol 900 gm., citric acid 100 gm., oil of lemon 200 gm.; mix, and after standing a few days, filter.

A CONVENIENT METRIC CONVERSION TABLE.

C. W. Hunt has compiled the following conversion table, which should be tacked up in a convenient place for handy reference. We reprint from Sci. Amer.:

Millimeters multiplied by 0.03937 equal inches.

Millimeters divided by 25.4 equal inches.

Centimeters multiplied by 0.3937 equal inches.

Centimeters divided by 2.54 equal inches.

Meters multiplied by 39.37 equal inches. (Act of Congress.)

Meters multiplied by 3.281 equal feet.

Meters multiplied by 1.094 equal yards.

Kilometers multiplied by 0.621 equal miles.

Kilometers divided by 1.6093 equal miles.

Kilometers multiplied by 3280.7 equal feet.

Square millimeters multiplied by 0.0155 equal square inches.

Square millimeters divided by 645.1 equal square inches.

Square centimeters multiplied by 0.155 equal square inches.

Square centimeters divided by 6.451 equal square inches.

Square meters multiplied by 10.764 equal square feet.

Square kilometers multiplied by 247.1 equal acres.

Hectares multiplied by 2.471 equal acres.

Cubic centimeters divided by 16.383 equal cubic inches.

Cubic centimeters divided by 3.69 equal fluid drams. (U. S. P.)

Cubic centimeters divided by 29.57 equal fluid ounces. (U. S. P.)

Cubic meters multiplied by 35.315 equal cubic feet.

Cubic meters multiplied by 1.308 equal cubic yards.

Cubic meters multiplied by 264.2 equal gallons (231 cubic inches).

Liters multiplied by 61.022 equal cubic inches. (Act of Congress.)

Liters multiplied by 33.84 equal fluid ounces. (U. S. P.)

Liters multiplied by 0.2642 equal gallons (231 cubic inches).

Liters divided by 3.78 equal gallons (231 cubic inches.)

Liters divided by 28.316 equal cubic feet.

Hectoliters multiplied by 3.531 equal cubic feet.

Hectoliters multiplied by 2.84 equal bushels (2150.42 cubic inches.)

Hectoliters multiplied by 0.131 equal cubic yards.

Hectoliters divided by 26.42 equal gallons (231 cubic inches.)

Grams multiplied by 15.432 equal grains. (Act of Congress.)

Grams multiplied by 981 equal dynes.

Grams divided by 28.35 equal ounces avoirdupois.

Grams (water) divided by 29.57 equal fluid ounces.

Grams per cubic centimeter divided by 27.7 equal pounds per cubic inch.

Joule multiplied by 0.7373 equal foot pounds.

Kilograms multiplied by 2.2046 equal pounds.

Kilograms multiplied by 35.3 equal ounces avoirdupois.

Kilograms divided by 1102.3 equal tons (2,000 pounds.)

Kilograms per square centimeter multiplied by 14.223 equal pounds per square inch.

Kilogrammeters multiplied by 7.233 equal foot pounds.

Kilograms per meter multiplied by 0.672 equal pounds per square foot.

Kilograms per cubic meter multiplied by 0.062 equal pounds per cubic foot.

Kilograms per cheval vapeur multiplied by 2.235 equal pounds per horse power.

Kilowatts multiplied by 1.34 equal horse power.

Watts divided by 746 equal horse power.

Watts divided by 0.7373 equal foot pounds per second.

Calorie multiplied by 3.968 equal B. T. U.

Cheval vapeur multiplied by 0.9863 equal horse power.

(Centigrade multiplied by 1.8) plus 32 equal degrees Fahrenheit.

Francs multiplied by 0.193 equal dollars.

THILANIN.—A brown ointment containing 3 per cent. of sulphur: obtained by action of sulphur on hot lanolin.

THIURET.—The product of the oxidation of phenyldithiobiuret, forming an inodorous antiseptic powder, which is soluble in alcohol and ether, but insoluble in water.

PSEUDO-HYOSCYAMIN ($C_{17}H_{23}NO_3$). — Found along with hyoscyamine and hyoscine in the leaves of the Duboisia myoporoides. It possesses the properties of a mydriatic and can be used as a sedative but not hypnotic.

"In the Case That a Physician Prescribes a Patent or Proprietary Medicine, and Said Medicine is Dispensed and is Taken by the Patient, the Result of Which is Disastrous, Who is Responsible for the Death?"

A. W. Griffith, secretary of the Austin, Tex., Pharmaceutical Association, at a recent meeting, read a paper on this subject, in which he said:

From the poison head of this monster there licks a forked tongue that gives warning to the physician, druggist and to those that drink at its fountain. To the physician it robs him of his chance and supplants him in his cause. To the druggist it takes away his title and makes him an agent for its sale. To the people, it is a serpent true; some are bitten, some recover, and some must die; and though we may look with an eye of hatred upon this monster evil as it towers up and casts its unwelcome shadow over our chosen profession, we are forced to realize that the extinction of this money-making project cannot be accomplished within a day, or possibly for years. But must there be idleness on our part in a period of the evil's greatest prosperity? Must we hush our mouths, fold our arms to wait for the next generation to bring forth warriors who will take up arms and battle against the evil that is striking at the most vital part of our profession?

A reformation in the drug world will some day be accomplished, and this evil will be quelled by law. But to us, it falls our lot to start the ball to rolling. There is no cause why druggists should not seek to regulate the present incomplete pharmaceutical legislation. As it is, we are made the agent of the very evil that is degrading our profession and depriving us of a well-deserved and honest profit, by compelling us to buy and dispense those preparations that might as well be sold in a grocery store.

This "trade-mark" law should be prosecuted by every lover of honest pharmacy. But the immediate question with us to-night is: Who is responsible for the sequel of this evil?

When we, though with reluctant fingers, break the seal of one of those bottles, the contents of which we know only by sight and smell, it is like breaking the shell of an egg—we hope it is good, but it may be bad. Of the two, the latter is preferable, for by the use of the nasal organ we are enabled to distinguish the good from the bad. In the former the rottenness is screened from each of our senses. In our compulsion to dispense those preparations we are obliged to bid farewell to the injunctions of our preceptor: "Be sure you are right," etc., and dive into a field of uncertainty—for the source of such knowledge is beyond our reach. We may consult our dispensatory, examine the volumes on pharmacy, scan the pages of chemistry and rumple the pages of journals, and, finally, return without the information sought. It is like seeking the fountain of youth—we are only older when the search is over.

The responsibility, I believe, is divisible by three. Naming them in rank, I beg to place the protection of such a preparation first, for it is the rankest law ever written; second, the manufacture; third, the physician and druggist. First, the Government: The most prominent thing that greets us on one of these sacred labels is the "trade mark," protected by the same government that makes the laws by which our lives are protected; the same government that demands our dispensatory; and the government that should dispatch such a manufacturer out of existence. Why is such a preparation put upon the market? Undoubtedly for the gains the manufacturer expects to realize from its sale. With this object in view he applies to the government for the exclusive right to prepare and sell his preparation. The request is granted and the preparation goes out on the market world, and by circumstances some unfortunate mortal becomes the victim of its poison. Then is not the protection of this article partially responsible for the death of this man? Would it not be better for the law to protect that man's life from such toxic exposures than to protect that which killed him? Instead of giving the manufacturer the protection, the law should be just the reverse and make it an offense to prepare and sell a preparation, the formula of which is known but to the man that makes it. Why? Because, even admitting that the formula is filed with the trade mark to insure its virtue, where is the man to say it will enter into combination with every simple compound or synthetic preparation and retain its virtue and cause no harm?

New medicines are constantly being put upon the market; incompatibles are being discovered almost daily, and we know that incompatibles are occasionally poisonous. Then, how can we know that these preparations, when prescribed in combination with other medicine, will not, in some instance, produce poison? And even when prescribed alone, how is it to be known that the result will not prove disastrous to the existing condition of the patient?

The law should remove such dangerous chances, or the government is responsible for the disastrous results of its laws.

The compensation the government receives for the license of such chances is indeed small, when compared to the life of one of its subjects.

If the manufacturer would make the formula his trade mark, then the responsibility would be removed. We would then be given a chance to detect the formation of a substance that should not be put into the hands, much less the stomach, of the patient.

To recapitulate: I claim that the government is first of all responsible, because, instead of giving protection to such secret remedies through a trade mark, and thereby encourage its manufacture, it should legislate directly against it; and because it gives the manufacturer the right to prepare and sell his remedy at all hazard.

The next responsibility rests upon the manufacturer. Well, what has this man done to merit our confidence? Are we to fall on his neck and call him brother and accept his statements, all because Rev. P. I. Johnson, of Lowell, Mass., says that he was given up for dead and was partly buried when this medicine returned his health and made him even younger than before. If the manufacturer is a professional man, to what profession do you think he properly belongs? No one will deny that his chief object in putting a preparation or a line of preparations upon the market is to make money. And when he assigns his preparation in the elaborate phrase, "a boon to mankind," he only means, "I want your money." And with this end in view he adds everything in the vocabulary of drugs to his preparation that he thinks will increase its sale, however, in the meantime, taking care that he adds nothing expensive to his preparation, lest his profit will fall short. That this is true you will admit. Have we any evidence that this man's purpose in life is to benefit his fellow man? On the contrary, does not the evidence prove that he is here to be benefited by his customers? Then, is this the man in whose hands we are apt to place the lives of our friends? Is this the man to supplant the medical science? And when the grave opens to receive into its bosom the victim of this man's "All-Healing Remedy," shall we not place responsibility upon the head of the producer of this poison? "If the court knows itself, and we think it do," this man stands convicted.

Next in line of responsibility come the physician and druggist. I do not assign quite as much of the responsibility to the physician as I do to the druggist—speaking of pharmacy in general throughout the United States—because we, the druggists of the United States, should be responsible for the laws that protect these preparations. We are the ones to eventually remove these chances; we are the ones to adjust the existing laws and suggest the proper pharmaceutical legislation, for we study the interest of our customers and know best what is for their good. Did it ever occur to you that there are many things along this line that the druggists *Really do know?* They *do* know that the very remedy that cured Mrs. Takeall of the last stage of consumption and brought forth her recommendation, is liable to cause Mr. Useall to write his will. They do know that nine-tenths of the people who spend their hard-earned money for patent medicines would do as well with it to sink it into a well. And they do know that there are unregistered druggists practicing pharmacy in the country who know no better than to recommend and advise the use of these patent medicines, simply because they do not know of anything else to advise. And they do know—each and every one of you know—and every druggist in Texas knows that they should be working for the present proposed pharmacy law in Texas, and thereby let the good work begin.

When a patent medicine is prescribed the druggists are better provided to scan the situation than is the physician, because they have the medicine in their hands; they observe the appearance and note the result of combination, and if not satisfied as to its safety no druggist should hesitate speaking to the physician concerning it, and thereby guarantee your safety. The physician will in turn appreciate your interest. Whenever in doubt the physician is the man to remove that doubt. The physician often has a cause for prescribing a proprietary medicine. The virtues of the medicine are clearly shown to him, either by demonstration or recommendations, and he finds it convenient for prescribing. The formula, in part or in whole, is often known to him, and he prescribes it with the motive of benefiting his patient. But does the physician always know what chemical change will take place on long standing, what decomposition, and what will be the nature of the new substance, and what it will and will not combine with, and what will be the result of such a combination? With these uncertainties, I think it advisable to let some of the responsibility rest upon the physician.

A New Process of Producing Photographs in Colors.

In a paper read before the Society of Arts by Sir Henry Trueman Wood, secretary of the society, on "The Production of Color by Photographic Methods," and reported by Sci. Amer., he describes the recent process invented by Dr. Adrien Michel Dansac and Mons. V. Chassagne and called "Chassagne's color process," as follows:

"The process, so far as we know it, is as follows: A negative is taken on an ordinary gelatine plate, which has been prepared by treatment with a solution, the ingredients of which are unknown. The negative thus obtained shows no trace of color, and appears in all respects like any other photographic negative. From it a print is taken on ordinary albumenized silver paper which has been treated with the before mentioned solution, or, if a transparency is desired, on a gelatine plate prepared in the same manner as that which was used for the negative. This print shows no trace of color either by reflected or transmitted light. The print when dry is washed over with the solution, and is afterward treated successively with three colored solutions—blue, green, and red—the operation being conducted in a bright light. As the solutions are applied the print gradually takes up its appropriate colors, the intermediate tints being, it is supposed, produced by a mixture or combination of the three primaries. That a yellow color should be produced by a combination of what are presumably green and red pigments is not in accordance with expectation, for though red light and green light, when superimposed produce yellow, we do not get yellow by mixing red and green coloring matters. Probably the yellow is produced by the application of a yellow dye mixed in the green solution, and not by a combination of colors.

"It is to be noted that the process is not one for the direct reproduction of natural colors. It is, rather, one for treating a photographic print in such a way that it enables it, one might say, to automatically paint itself—to take up in the proper parts the colors which are required, rejecting them in the parts where they are not required. How this is effected is at present a mystery, and perhaps with the limited amount of information available it is not worth while speculating upon it. How a monochrome negative can confer on a monochrome print this power of selective absorption has yet to be explained. I can offer no suggestion on the subject. I am informed that a negative of special character is required to produce the colored positives, and that is all I know about it.

"The results certainly are produced, and there seems no reason to doubt the good faith of those who state they were produced in the manner described. Of course when we are thus asked to accept facts without receiving an explanation of them, we require, as I said before, very strong evidence that the facts are genuine. Examination and experiment, so far as they have yet gone, have thrown no doubt on the statements made, and the inventor, I wish to say most distinctly, has offered every facility for inspection so long as the secret of his materials is respected. Sufficient time has not elapsed for crucial tests to be made, but we may reasonably expect that the process will stand those tests as well as it has those to which it has been submitted.

"I have myself seen the colors applied in the way I have described, and the promised results produced. Mr. Herbert Jackson and myself took negatives on Mons. Chassagne's plates of various test objects. Mr. Jackson was afterward kind enough to make some positives from these plates, and neither negative nor positive was touched, or I think seen, by Mons. Chassagne, until we placed them in his hands that they might receive their final treatment. On the application of the coloring solutions, we saw that the proper colors were produced.

"Photographically the results we obtained were very poor; the prints were extremely thin and unsatisfactory, as was not to be wondered at, since the negatives were taken on a dull, foggy-day. Nevertheless they showed a great deal more than traces of the proper colors. A blue china vase, with a piece of red ribbon tied round it, and containing a bunch of flowers, was reproduced with perfect accuracy, though the image was thin and faint. An Indian brass pot showed not only the yellow color of the brass, but also distinctly metallic luster. Altogether I can only say that the results of these experiments, so far as they went, satisfied myself, and I think the others who saw them, that the results were produced in the manner described. Were it not for the novelty of the process, and the difficulty of accounting for its results, it would be accepted without hesitation. Whatever hesitation exists is, after all, but a testimony to its importance.

"I have been taken to task by some of my friends for accepting results so remarkable without evidence more substantial. I can only say that I think any of you who saw the process carried out would have arrived at the conclusions at which I arrived. All evidence is a contest of opposite improbabilities. It seemed to me more probable that the colors were produced in the manner stated than that the prints were first painted by hand, then bleached and then the colors restored under my eyes by the application of some mordant; or that the operator, who seemed to be sluicing and dabbling his color all over the print, was really painting it on in the proper places. I can think of no other alternative. Still I freely admit I shall myself like further proof. I look forward shortly to being supplied with the materials, and I shall not be absolutely happy until I have myself produced something which however inferior it may be to the very beautiful examples we have here to-night—shall yet show the colors of an original subject taken by myself.

"In a secret process such as this it does not seem worth while to speculate. Because it is a waste of time, guessing how results are produced that we may expect to have fully described to us in a short time."

Manufacture of Gold in India.

The transmutation of metals, long sought by medieval alchemists, and now asserted in the latter days to have been accomplished by an American chemist, is a matter of daily practice among the fakirs of India, if we may trust their own claims; and, indeed, M. Hector Léveillé assures us in Cosmos (Literary Digest) that he has witnessed the process with his own eyes; that is, he has seen the fakirs make an alloy that looks like gold and answers some of the simpler tests, although, he prudently remarks, it has not the same chemical qualities. He gives us some of the receipts used, and by following them any of the amateur chemists among our readers may verify his words with reasonable ease, for it is to be presumed that the herbs and vegetable juices enumerated are not necessary ingredients, and the lack of them need not deter the American experimenter. Says M. Léveillé.

"For a long time, in India, the apparent transmutation of tin, zinc, copper, and mercury into precious metals has been practiced. We have seen there with our own eyes a metal like gold issuing from the crucible of the Indian alchemists—a metal that could not be told from real gold by means of the touchstone. We may say, however, that in old India, as well as in young America, they have not yet succeeded in giving to the metal thus obtained the chemical properties of gold. On this point they are not more advanced in the one country than in the other, and the problem seems to us not to be near solution. The metal obtained can, in fact, be decomposed into its constituent elements. Nevertheless it may be interesting to present to public notice the Indian alchemists and to describe their methods."

These alchemists, M. Léveillé goes on to tell us, are always either fakirs or sannyassis (penitents). The latter are remarkable people, accustomed from youth to eat poisons, drink mercury, and resist heat and cold. They live in the mountains and the woods, and are regarded as sacred. Says the writer:

"Around these personages many legends have sprung up. The people assert that they never come into a city except by divine inspiration, in order to cure illness and to enrich certain persons. There is a belief among the Hindus, very widespread, but purely fabulous, that they disappear at certain hours to rejoin the cittars, divine naturalists of the early ages of India, who, according to Hindu tradition, meet with their divinity, Hari Ishari, on the summit of the Himalayas, to learn the secrets of nature.

"The following is the method employed by these Indian alchemists to make their gold. We give literally, conforming to the weights and measures in use in India, the list of substances necessary for this delicate operation.

"These are, according to our documents:

"Sulfur of Nelli-Kai (Phylanthus lemblica), 24 rupees' weight (7 ounces).

"White seeds of Abra precatorius, 9 rupees' weight (2½ ounces).

"One whole garlic.

"Cinnabar, 6 rupees' weight (2 ounces).

"English orpiment, 6 rupees' weight.

"Sal ammoniac, 6 rupees' weight.

"These are powdered separately, and then a paste is made of the whole, with three quarts of 'paddy' made of the milky juice of the Asclepias gigantea. The whole is ground up with this milk.

"Then little hard balls are made of the mixture, and finally two sattis are taken, of fine, hard earthenware, of such size that the material to be distilled occupies only one-third or one-fourth of the vessel. On the lower vessel another satti is soldered with potter's earth, after an opening has been made in the end of this second vase.

"Over this hole is fitted a bottle, whose end is pierced, and it is carefully sealed to the vase.

"Into the lower vase are put the little balls described above, and the whole is then sealed up.

"The powder, when vaporized, rises along the sides of the bottle and condenses around the hole. It is collected with a feather. Then zinc is taken; for each rupee's weight of zinc is allowed a quantity of the powder as large as two or three rice grains. The zinc and the powder are wrapped up together in a bit of paper or linen or a leaf. The whole is put into a crucible, which is then sealed with a paste composed of one part of cow-dung, one of charcoal, and one of potter's earth. This is placed on a fire of wood-charcoal and heated white hot, after which it is allowed to cool.

"Open the crucible—you are a rich man!"

A similar formula, we are told, suffices for the manufacture of silver. The Hindu alchemists, it will be seen, do not preserve the same secrecy as those in more civilized lands, and freely give us all the opportunity of becoming wealthy.

Electricity from Carbon Without Heat.

In a paper read before the New York Electrical Society (reported in Sci. Amer.), Mr. Willard E. Case gave some interesting information and experiments on "Electricity from Carbon Without Heat," a subject which he has been studying for some years. The lecturer described the devices thus far employed to oxidize carbon without heat in the electric battery. The lecturer had his apparatus with him and performed experiments before the audience. He used a cell of his own invention. Plates of tin and platinum formed the electrodes, and the carbon being oxidized by contact with chemicals, electricity was produced, as was shown by attaching the wire from the cell to a motor. A thermometer applied at various stages showed that no heat was generated; hence, practically, the entire energy of the chemical charge was converted into electricity. Having concluded this experiment, Mr. Case brought out the possibility of the discovery of a method of obtaining electricity from carbon without heat, by following plans analogous to the method employed by nature in the human system. He drew attention to the processes going on in the animal organism by which the carbon is oxidized by the instrumentality of the hæmoglobin of the blood, which acts as an oxygen conveyor.

The point Mr. Case specially dwelt upon was that work in the direction of rendering the experiment of practical value lay in the suitable preparation of the carbon for the oxidizing material to act upon.

The hæmoglobin cell was a fine example of what many scientists have, for a long time, insisted upon, namely, that the closer the processes of nature can be approximated, the nearer and quicker they will come to attain their end.

GAMBLERS' INK.—Take a small quantity of dark-blue or scarlet diamond dye, put it into a 2-dram vial and dissolve in glycerin over a lamp; then add about 10 grains of carbolic acid crystals, and ether enough to fill the vial. Keep well corked, and when required for use heat over a lamp and apply it to the card with a common steel pen.—W. Dr.

PHOTOGRAPHING THE INVISIBLE BY SUGAR.—Professor A. F. McKissick, of the Auburn Polytechnic Institute, Alabama, announces that he has discovered that common granulated sugar, if exposed to direct sunlight for two hours, and then placed in a dark room with a photographic plate, emits light enough, or, at any rate, rays enough to photograph objects on the plate through a thickness of 2½ inches of wood. Following up Becquerel's experiments with the fluorescent compounds of uranium, the professor tested a number of substances, and found that white granulated sugar gave by far the best results. Professor McKissick suggests that the rays are not X rays, but a connecting link between them and ordinary light.

Tetanus Antitoxin.

One by one the diseases which have hitherto defied the skill of physicians are yielding to the persistent attack of modern science. Since the successful treatment of diphtheria by subcutaneous injections of antitoxic serum was demonstrated—hardly three years ago—it has been confidently predicted that sooner or later all diseases which result from the action of a poison secreted in the blood by a special and characteristic bacillus would be conquered by similar means.

From the evidence now presented, it would appear that tetanus, one of the most sinister and stubborn of human maladies, if not already conquered, is in a fair way to be successfully overcome. In the Deutsche Medicinische Wochenschrift (Berlin) some time ago appeared a joint announcement by Prof. Dr. Von Behring, of diphtheria-antitoxin fame, and Professor Knorr, of Marburg, describing the qualities and best methods of using the new tetanus antitoxin, which is now prepared under government supervision as a commercial product by the Farbwerke at Hoechst-on-Main, and offered for use by medical practitioners under the same conditions as diphtheria antitoxin from the same source.

Tetanus, as is well known, is an exceedingly painful and hitherto usually fatal disease caused by blood poisoning, generally the result of a wound. It is believed by physicians to be caused by the introduction into the system of a minute organism which rises from the ground in certain localities, so that the prevalence of tetanus varies greatly even in different districts of the same country. At all events, the disease has its characteristic microbe, which has been recognized, isolated, described, and reproduced by artificial culture. The distinctive symptom of tetanus is a persistent spasm of the voluntary muscles, aggravated by light, noise, or other disturbing influence to which the patient may be subjected. These spasms may affect any muscular portion of the body, but when, as is often the case, the maxillary muscles are principally attacked, the resulting malady is known as lockjaw.

The tetanus antitoxin described by Professor Behring and Dr. Knorr is similar in nature, action, and in the methods of its preparation to the antitoxin of diphtheria. It is prepared and put up for use in two forms, viz., as a dry powder, which is used for the treatment of developed cases of tetanus in men and animals, and as a liquid solution, which is employed for prophylactic purposes. Its strength or degree of efficiency is measured, like that of antidiphtheritic serum, by antitoxic units. The dry antitoxin is designated as a hundredfold normal antitoxin—that is, 1 gram of the preparation contains 100 units of antitoxic power; in other words, is sufficient to neutralize 100 grams of the normal poison of tetanus. It is put up for commerce in vials containing 5 grams each, and the contents of one such vial are theoretically sufficient for the cure of a developed case of tetanus. It is dissolved in 30 cubic centimeters of sterilized water at a temperature of 40° C, and injected hypodermically at a single dose. In the treatment of horses, the injection is made into a vein, by which the full action of the antitoxin is accelerated by about twenty-four hours, and this method of injection may even be employed with human patients in very severe cases or where the treatment is commenced at a late and perilous stage of the disease. To insure favorable results, the injection should be made, if possible, within thirty-six hours after the presence of tetanus is definitely indicated. The liquid solution is protected from contamination by germs in the atmosphere by a small admixture of phenol. The dry preparation, on the other hand, requires no such antiseptic while in that form, but when dissolved in water it becomes subject to deterioration, which may be prevented by the addition of 1 per cent. of chloroform.

The tetanus solution is of fivefold strength, that is, 1 gram of the liquid contains five antitoxic units, and in this form it is put up in sealed 5-gram vials. In presence of wounds which give reason to fear lockjaw or other forms of tetanus, a small subcutaneous injection of the solution is made, the quantity used being proportionate to the condition of the patient and the time that has elapsed since the injury was received. In all cases, the wound should be antiseptically treated, so as to prevent as far as possible the further generation of poison in the blood.

Tetanus is a disease of seldom occurrence in this section of Germany, and opportunities to test the remedy in actual practice are comparatively rare. One such case has been recently treated at the Hospital of the Holy Spirit, in Frankfort, the record of which is officially and minutely given.

On the 19th of September last, a coppersmith (L. M.), 25 years of age, and resident in Frankfort, experienced after exposure to thorough wetting severe pains and stiffness in the muscles of the neck and throat. Two days after the first symptoms appeared he came under treatment by a physician, who kept the patient in bed and administered chloral and salicylate of soda. The symptoms of tetanus continued to develop, and on the night of the 29th of September became so marked and violent that on the following day the patient was transferred to the hospital. A careful examination revealed a small cut or scratch under the right ear, then nearly healed, and so slight in outward appearance that it had passed almost unnoticed. At the time of admission to the hospital the patient was growing rapidly worse. The chin was twisted far to the left, the head drawn backward and immovable, and the muscles of the body, especially the back and abdomen, were hard and tensely drawn. The patient was isolated in a dark room and treated with subcutaneous injections of morphine, which gave no relief. The slightest noise or disturbance, such as the entrance of the physician or nurse into the darkened room, induced severe spasms, and the condition of the sufferer continued to grow steadily worse. At 4 o'clock in the afternoon of October 1 a prolonged spasm of intense severity left no further doubt of a fully developed case of tetanus, and half an hour later 5 grains of the hundred-unit antitoxin, dissolved in 50 grams of water, were injected hypodermically at three places on the breast.

During the evening of the same day, a slight but definite improvement was observed, and this continued throughout the following day, the spasms being fewer and of shorter duration than before the antitoxin had been administered. This condition was maintained from the 3d to the 6th of October, when the acute symptoms gradually returned, and 9 o'clock in the evening, became so severe that a second dose of 4 grams of normal antitoxin was administered as before, with the result that before the next morning the muscles began to relax, the spasms became lighter and less frequent, and from that time, improvement was so rapid and sustained that on the 23d of October, sixteen days after the second injection of antitoxin, the patient was convalescent, and, at his own request, was discharged from the hospital.

This, in the opinion of the physicians in charge, was a typical and conclusive case, in which life could not have been saved by any other treatment previously known, and in which the course of the disease might unquestionably have been arrested and greatly shortened had the antitoxin been used when the patient first came under medical treatment instead of ten days later, when the case had become one of acute and fully developed tetanus.

It is, of course, too soon to estimate the exact prophylactic or therapeutic observations in actual practice, which will be made as rapidly as the comparative rarity of the disease itself will permit. Thus far, the antitoxin has been used experimentally, both in this country and in France, with horses, cattle, guinea pigs, mice, etc., and from these tests, and the hospital case above described, the indications are that its use entails no injurious result. The antitoxin is prepared with extreme care, subjected to rigid inspection and control at the imperial testing laboratory at Steglitz, and with this guaranty is placed within reach of bacteriologists and medical practitioners in all countries.—Frank H. Mason, Consul-General, Frankfort.

PHARMACY.

EUCAIN B.—Closely related to eucain A, but far less toxic, and is recommended to ophthalmologists in 2 per cent. solution.

SAGRADIN.—A compound consisting of a 20 per cent. solution of cascara extract, deprived of its bitter principle, to which 2 per cent. of spirit of peppermint has been added.

PERONIN.—The hydrochloride of the benzyl ether of morphine, the hydrogen of the hydroxyl group of morphine being replaced by the alcohol radical $C_6H_5CH_2$. Peronin is given in doses of 0.02 to 0.04 gm. as a sedative and also for the relief of the cough of consumptives.

DICODEYL—METHANE.—A new condensations product of codeine and formaldehyde, in which two molecules of the former unite with one of the latter with separation of a molecule of water. The hydrochloride of this base is readily soluble in water and alcohol, and melts at 140° C. It is proposed to use this new compound in medicine.

NICKEL PLATING FLUID.—The following solution is said to deposit readily upon all metals. The solution is prepared by dissolving 1 kilogram of nickel sulphate, 725 gm. of neutral ammonium tartrate and 5 gm. of tannic acid (dissolved in ether) in 3 to 5 liters of hot water, filtering and adding water to make 20 liters. The solution must be neutral.

POTASSIUM PERCARBONATE is a new bleaching agent recently brought out. According to the Textile World, it is the product of the electrolysis of a concentrated solution of potassium carbonate, caustic potash and free hydrogen being produced at one pole and a potassium salt with a hitherto unknown acid (percarbonic) at the other. In the dry state the new compound is a bluish white, extremely deliquescent powder containing a mixture of carbonate, percarbonate and bicarbonate of potassium. Experts say it seems suitable for the bleaching of wool and silk, but not of cotton. A Swiss factory has secured the right to manufacture it, and, according to the authority cited, it is likely to be put upon the market shortly as a new source of hydrogen peroxide.

ANTI-RUST PREPARATION.—A gentleman prominently connected with the trade writes to Iron Age that the following simple mixture may be successfully applied to bright metal goods to keep them from rust or tarnish. It is made of 1 quart of good turpentine to which is added ½ pint of dammar varnish. Cutlery, mechanics' tools and other goods dipped in this dry quickly, the transparent film on the surface being, it is said, almost imperceptible. If a tool or article is partly japanned it can be entirely covered as well. Some samples on box fronts are referred to as still doing duty in a store fitted up twenty-five years ago, and in as good condition now as when first covered. An article to be treated should be first well wiped with a clean rag or chamois.

ARTIFICIAL OIL OF VIOLET.—F. Fritzsche & Co., of Hamburg, have prepared a new synthetic essence or oil of violets, which has nothing in common with the well-known ionon. In concentrated condition it has an odor reminding one of oil of sandalwood, and not until it is well diluted does its violet odor become apparent. The firm prepares a 20 per cent. alcoholic solution for use in perfume extracts, admixed with cedrol for perfuming soap. For preparing one kilo of violet extract one gram of the artificial product is necessary, or 5 grams of the 20 per cent. solution; for perfuming 100 kilos of soap 50 or 250 grams of the respective solutions. The price of the artificial extract is 1,400 marks ($350) per kilogram, or 340 marks ($85) per kilo for the 20 per cent. essence.

SYRUP OF PIXOL COMPOUND.—For many years past Dr. James E. McKeon, of Medford, Mass., has made a cough mixture by this name for the want of a better. Squibb's Ephemeris gives this formula:

Oil of tar (Pix Liquida)	3.7 cc.
Fluid extract of ipecac	15.0 cc.
Camphorated tincture of opium	30.0 cc.
Glycerin	60.0 cc.
Syrup of wild cherry	120.0 cc.
Distilled water	150.0 cc.
White sugar	q. s.

Rub up the oil with 15.5 grams of magnesium carbonate, add the fluid extract ipecac, camphorated tincture opium and water in order—each gradually—and then add the syrup and glycerin. Incorporate all well together and filter. To the filtrate add enough sugar to make the product measure 473° Cc.

TO DISTINGUISH BENZOLE AND BENZIN.—Owing to frequent errors made through confusion of the terms benzene (benzole) and benzine (petroleum), Prof. Lainer (Photog. Corresp.) offers several tests which are readily applicable by photographers, chemists and pharmacists who have frequent occasion to use these solvents.

Coal tar benzole is colored carmine red on addition of a crystal of iodine, while petroleum benzine is colored violet; this test is very reliable, and is even applicable in admixtures of the two. To 2 cc. of the benzole or benzine, 3 to 4 drops of a clear, ethereal solution of sandarac (1 : 10) are added, a permanent turbidity is imparted to benzine, while benzole, which is at first turbid, soon clears up. The addition of more sandarac solution causes the latter to become turbid. On shaking benzole with traces of alcohol it becomes turbid, while benzine remains clear.

A NEW DIRECT BENEFIT FROM INSECTS.—When Kirby and Spence wrote their chapter on "Direct benefits derived from insects" and recorded the use of insects for food, the use of honey from bees for the same purpose, the use in medicine and the arts and manufacturers of blister beetles, insect galls, Coccidæ furnishing lac, wax insects and the silkworm, the time had hardly arrived for the extensive collection of ants for the manufacture of formic acid or of their pupæ as food for song birds, and we feel sure that they could hardly have anticipated an industry which has recently sprung up both in France and Pennsylvania, and which consists of the farming of spiders for the purpose of stocking wine cellars, and thus securing an almost immediate coating of cobwebs to new wine bottles, giving them the appearance of great age. This industry is carried on in a little French village in the Department of Loire, and by an imported Frenchman named Grantaire on the Lancaster pike, four miles from Philadelphia. This Frenchman raises Epeira vulgaris and Nephila plumipes in large quantities, and sells them to wine merchants at the rate of $10 per hundred.—Bulletin U. S. Dept. Agriculture.

MEAL-WORMS IN SODA ASH.—During October we received from Dr. John B. Porter, consulting chemist, of Glendale, Ohio, specimens of living larvæ of the meal worm, Tenebrio obscurus, in a box of soda ash. Our correspondent wrote that they were found in a carload of this chemical, the crude sodium carbonate, from Syracuse, N. Y. They were noticed within 6 or 8 inches of the bottom, and most numerous nearer the bottom, and especially at the corners and edges. The men who handle this material make positive statement that they frequently find cars containing immense numbers of them, and that often they penetrate nearly two feet into the mass. They also state that these larvæ are only found in October, November and December, and further, that once they were found living in large numbers in a bin which had been full of soda ash and tightly closed for eight months. The car from which our specimens came contained thousands of living and some few dead larvæ. The only plausible explanation of the presence of the meal-worms in the soda ash is that the cars had previously been used in shipping quantities of meal, flour, grain, or similar material in which the insects had been breeding. These larvæ attain approximate growth toward the beginning of the autumn, which will explain their having been found only from October to December. It would be impossible for insects to feed on soda ash, and the wonder is that the Tenebrio larvæ are able to live at all in so caustic a substance.—Bulletin U. S. Dept. Agriculture.

PREPARATION OF PEPSINE WINE FROM THE FRESH STOMACH OF THE CALF. At a meeting of the Glasgow and West of Scotland Pharmaceutical Association held on Feb. 18 (Br. & Col. Dr.), Mr. R. Brodie read a paper on this subject, in which he said the subject of pepsine was of interest to him, for he had been in the habit of preparing pepsine wine from the fresh stomach of the calf for a good many years. The directions given for the preparation of the essence were, he found, unsuitable for the wine. He prepared the wine as follows: Obtaining the stomach the same day as the animal was killed, he removed all the fat from the exterior, then opened it up and washed it under a running tap to remove any fragments of food, usually consisting of masses of curdled milk. After allowing it to drain a short time, he cut it up into small pieces and put into a wide-mouthed bottle, putting in a pint of wine, which ought to be a good sherry, and allowed it to macerate for three weeks with occasional shaking. He then added a small quantity of acid hydrochloric dilute, say ½ ounce to each pint, and allowed the maceration to go on for another week; then strained through muslin, and after allowing to stand for a convenient time filtered through paper. However, the result was a beautiful transparent preparation which should not require boric acid to preserve it. He tested the curdling activity of some the day before, which was made last July, and found that ½ dram curdled 12 ounces of milk in the space of four minutes, and in the other four it had set it into a good, firm curd.

CONSTRUCTION OF A MODEL PHARMACY LAW.—Prof. J. H. Beal presented a paper at the late meeting of the American Pharmaceutical Association, at Montreal, in which the ground taken was, that since it is improbable, if not impossible, that the practice of pharmacy could ever be regulated in the United States by national legislation, a wise plan would be the preparation of a general form of law to be recommended for adoption by the several States, with such modifications and detail as might be necessary to adapt it to local conditions and bring it into harmony with the various State constitutions. The immediate plan proposed was the appointment of a committee to communicate with the pharmaceutical boards, associations and colleges of the United States and Canada, requesting their co-operation in the preparation of such model, the form thus compiled to be presented for the consideration of the association at its next annual meeting. Action was taken upon the question by referring it to the Committee on Education and Legislation, which committee has now in preparation a plan of procedure which it hopes shortly to put into operation. Such a general form or model, says Prof. Beal (in Dr. Circ.) in order to accomplish the purpose of its creation, must be carefully constructed both in plan and in detail, and he discusses briefly some of the general principles which should be considered in its preparation. Experience is the only safe guide, and theory should wait upon it. A model such as this is intended to be is not the place for experiment, and all new and untried provisions should be scanned with sharpest scrutiny before receiving admission.

It is possible to find within the present pharmacy laws of the United States provisions bearing upon almost every conceivable point in pharmacy legislation. A model wisely framed will contain only such provisions as have already been tried and found efficient. By proceeding in this manner the model would be constructed exclusively of tried and tested materials, and its construction would involve simply a careful examination of existing legislation and the selection of those provisions which have been found to work well in practice. A law thus conservatively framed would possess the confidence both of pharmacists and public, and be assured of a speedy general acceptance, while a measure proposing new and radical features would be received with hesitation, and if after enactment in one or two States should be found faulty in a few leading particulars, would be entirely discredited. If made up of the best features to be found in the present laws, it will be a sufficient advance for this decade, and will be quite as much as the present condition of public opinion will tolerate.

The framers should keep steadily in mind the fact that pharmacy legislation can be justified upon no other ground than that of public policy. Pharmacy laws are not enacted for the protection of pharmacists, but for the protection of the State. Care should be taken, therefore, that nothing, either in the essential provisions of the law or in the manner of their statement, should be in the least suggestive of an attempt to legislate in favor of a particular class. Those who have had experience in the execution of such laws know with what jealousy they are regarded by courts and juries, and with what strictness they are construed. A law which either in its matter or its form is suggestive of monopoly cannot receive the cordial support of either courts or public, and without these supports its proper enforcement is impossible.

It is probably true that the pharmacist's condition under a good law properly administered will be better than under a poor law or under none at all, but his betterment must be that which he is entitled to as a member of society, and as the result of his obeying and having all others to render strict obedience to law. The benefit to pharmacy is and must always remain merely incidental to the benefit of the public as a whole. It follows, therefore, that the law should not only provide against the sale of drugs and medicines by incompetent persons, but should also require of licentiates that they conduct their business in a manner compatible with the public interest. Too many pharmacists, while anxious that they alone should be permitted to handle medicinal substances, yet view as burdensome every provision of the law which places a positive requirement upon them, and conceive themselves desperately "law-ridden" because they are required to keep registered clerks and record poison sales. Their neglect or evasion of these provisions is not only reprehensible in itself, but furnishes an excuse for the violations of law by the general merchant.

If the law gives the pharmacist exclusive privileges it must also impose upon him the obligation of exercising those privileges for the general good.

If the law is to reach practical results its framers must not put themselves too far in advance of public opinion. They should remember that they are not constructing a measure for the government of an ideal state of society, but for the present very complex and imperfect social organization; consequently the law must be adjusted to the existing order of things, and not undertake a readjustment of society to its own standard. Only those laws are well grounded which correctly represent public opinion. A judiciously constructed enactment may lead the public thought, but it cannot force it. Masses of men move slowly, and the wise legislator is the one who neither moves too far in advance of the public mind nor lags too far behind. The common mistake of reformers is in trying to accomplish in a year what should require a decade, and thus in attempting too much lose all. It would be better to prepare a form of law which shall represent a moderate advance over the present condition of affairs, and have it become effective by enactment, than to construct one theoretically perfect, but impossible of adoption for a quarter of a century yet.

The law should be as simple in its structure and as little involved in its composition as possible. By this it is meant that the methods provided for carrying the law into effect, as the registration of licentiates, prosecution of offenders, etc., should not be cumbersome, and should be as free from complication as they can be made. If the machinery of the law be heavy and unwieldly, the chances are that it will require so much of the energies of the board to set it in motion as to leave no surplus for the production of effective work.

It follows, therefore, that the law should not contain too much of detail. Some parts of the statute must necessarily be specific, but what is objectionable is the introduction of a mass of petty details dealing with matters that should be left to the intelligence and discretion of the board. Such minutiæ are not only useless to the administration of the law, but may frequently enable violators to escape conviction by the interposition of some technical defense based upon the turn of some doubtful sentence dealing with matters of minor importance.

Every provision should be clear cut and unmistakable in meaning. Each clause should be framed with the most thoughtful care, and should express just what is intended and not an iota more.

This rule has hitherto been most honored in its breach. Some existing statutes are so involved in their language that it is only by the most careful study that any one is able to form any conclusion as to their meaning, and even then with many misgivings as to the correctness of his interpretation. A statute the execution of which must always wait upon the interpretation of the Supreme Court will be productive of endless litigation and is of doubtful benefit.

The grant of powers to the pharmacy board should be made in unambiguous terms, the definition of the acts which shall constitute offenses against the law should be clear and certain, and every essential provision of the law expressed in such statements as will not admit of doubtful construction.

Equally as necessary as clearness of expression and certainty of statement is logical order. Not only should the separate provisions of the statute be conceived and stated with all the clearness possible, but their order and arrangement in the sections are of importance.

In many of the present laws, in addition to numerous ambiguities of statement, the separate provisions are entirely without logical order, but have been thrown together in haphazard fashion, without connection, correlation or agreement. Within the compass of a single paragraph may often be found provisions relating to the most diverse subjects, as the powers and duties of the board, the requirements for registration, the definition and punishment of offenses against the law, etc., etc.

Without attempting a minute classification the following is offered as a natural division of the proper subject matter of a pharmacy law:

1. Provisions relating to the board of pharmacy, its constitution, powers and duties, financial support, etc.
2. Provisions relating to registration and the qualifications of licentiates.
3. Provisions affecting the relations of the pharmacist to the public, as the sale and record of poisons, adulterations and sophistications, the sale of alcoholic liquors and narcotics, etc.
4. Penal provisions, defining offenses against the law, and prescribing their punishment.

Iodoform Substitute.

Dr. Koebl reviews a number of the more valuable so-called substitutes for iodoform as to their actual value in antiseptic surgery.

IODAL (Tetra-iodo-pyrrol).—As a wound antiseptic, it is of less general value than iodoform; however, it is an excellent deodorant, and promotes the healing process.

TRICHLORPHENOL.—When the dry powder is dusted over granulations a renewal of the bandage is rendered unnecessary up till the eighth day. The peculiar penetrating odor of this preparation is entirely masked by addition of oil of lavender.

TRIBROMPHENOL is an unusually active disinfectant, which hastens the separation of sloughing material. When freely applied it exerts a caustic effect.

TRIBROMPHENOLBISMUTH.—In action this resembles the preceding, and is also employed internally as an intestinal antiseptic.

SOZOIODOL SALTS.—Of these various salts, the sodium sozoiodolate is the best antiseptic; it is well tolerated by the skin and causes burning only on mucus surfaces, while the potassium salt is more irritating. Wounds should not be treated with this antiseptic. The mercury salt has shown itself to be a powerful but caustic antiseptic, while the zinc salt resembles the sodium compound.

ZINC SULFOCARBOLATE is void of toxic or caustic properties; it stops suppuration and heals rapidly.

SULFAMINOL (Thio-oxy-di-phenylamin) is very well adapted as a desiccant, being non-toxic, non-irritating and deodorizing.

ARISTOL (Dithymol-di-iodide).—Although it possesses but feeble antiseptic properties, it does not cause pain, irritates less than iodoform, and serves well in minor surgical operations because of its innocent nature.

EUPHORIN (Phenyl-urethane) is used mostly in the form of an antiseptic ointment in decubitus, burns, sores, etc

PYOKTANIN (Blue) forms a nontoxic antiseptic which is objectionable because of its staining.

DERMATOL (Bismuth subgallate).—By protracted use it requires caution, since light inflammatory symptoms appear. To check the secretions of fresh wounds and drying them dermatol answers very well.

SALOL.—This interferes with the development of bacterial life, and may be used as antiseptic dusting powder in similar instances as cited under euphorin.

EUROPHEN (Iso-butyl-ortho-cresyl-iodide). — Like iodoform, it is antiseptic; it diminishes the secretions, is hæmostatic and anodyne in effect.

GUAIACOL CINNAMATE possesses strong antiseptic properties, and favors the rapid healing of abscesses.

THIOFORM (Di-thio-salicylate of bismuth).—In its effect thioform resembles dermatol, but is less frequently employed.

LORETIN (Iodo-oxy-chinolin-sulfonic acid).—According to Dr. Koebl, this is to be preferred to all antiseptics since because of its insolubility decomposition takes place slowly, and it is entirely non-toxic.

AIROL (Oxy-iodo-gallate of bismuth).—An antiseptic of equal value to iodoform. It dries the surface of the wound rapidly, and facilitates granulation.

IODOFORMIN.—Superior to all iodoform substitutes because of its incomparable deodorizing power. In its decomposition iodoform is liberated.

NOSOPHEN (Tetra-iodo-phenol-phtalein).—A nontoxic antiseptic specially adapted for disinfecting mouth and nasal cavities.

TROPACOCAINE HYDROCHLORIDE. — Highly recommended as a local anæsthetic; has been recommended as a cheaper and effectual substitute for cocaine and eucaine. It is less toxic, stronger anæsthetic and more stable than the above mentioned remedies.

ARGENTOL ($C_9H_6N.\ OH.\ A_g$).—A compound of silver and oxychinolin, employed as an antiseptic in ointment form in treatment of lues; in solution for gonorrhœa.

QUESTION BOX

The object of this department is to furnish our subscribers with reliable and tried formulas and to discuss questions relating to practical pharmacy, prescription work, dispensing difficulties, etc.

Requests for information are not acknowledged by mail and ANONYMOUS COMMUNICATIONS RECEIVE NO ATTENTION.

Unanswered.

(I. H.) Maine. See rules applying to anonymous correspondents and non-subscribers at the head of this department.

Formula Wanted.

(B. S. S.) "Speed Sustaining Elixir," for fast horses.

Baking Powder.

(A. S. H.) See this journal, Dec. 24, 1896, page 826.

Lanoline Cream.

(C. S. D.) See formulas in this journal, Feb. 11, 1897, page 176.

Soda Water Formulas.

(Subscriber) We expect to publish very soon some new formulas for soda water drinks. They will appear in time for the coming soda season, and we believe they will be of the character you desire.

Lactated Pepsin Preparations

(C. W. F.) We cannot give you the formulas for the proprietary preparations. The National Formulary gives formulas for two pepsin preparations, containing lactic acid, diastase, etc. See formulas in the revised edition of that work, Nos. 59 (Compound Elixir of Pepsin) and 327 (Compound Powder of Pepsin).

Interstate and Diploma Registration.

(C. E. P.) See last issue of this journal, page 303. The New York State Board of Pharmacy registers without examination upon payment of the fee, applicants holding certificates by examination from the other boards of pharmacy in the State, viz.: New York City, Kings County and Erie County.

Elixir Saw Palmetto and Sandalwood Compound.

(P. A. L.) The following, under the above title, is from Griffith's "Non-Secret Formulas:"

Fluid extract saw palmetto	2 ounces
Oil sandalwood	¼ ounce
Alcohol	1¾ ounces
Simple elixir, enough to make	16 ounces

We cannot give the formula for the proprietary article you name.

California Board of Pharmacy and College Graduates.

(C. S. D.) The California Board of Pharmacy is allowed to register graduates holding diplomas from regularly incorporated colleges or schools of pharmacy, and who have had a certain amount of practical experience before receiving such diplomas. Why not refer your query to the secretary of the board, John H. Dawson, Valencia street, corner Twenty-third, San Francisco?

Antiphlogistine.

(D. A. B.) "Antiphlogistine" is a proprietary preparation recommended by the manufacturers as a "local prophylactic and curative for superficial or deep inflammation." It is described as a "paste, about the color and consistency of putty. It is spread on the skin an eighth of an inch thick, much the same as mortar is spread on the lath, and allowed to remain till nearly dry—12 to 48 hours." We cannot give the formula.

Coloring Hair Oil Red.

(W. A. C.) Your preparation of hair oil may be colored red with alkanet root or alkanin. The quantity of alkanet root necessary depends upon the shade of red desired. As a "starter," digest in 8 ounces of castor oil about 1½ or 2 drams of alkanet root for three or four hours, and strain. You can then add your other ingredients. The proportions given are those usually employed for a pint of finished product. If the resulting tint is not satisfactory, use more or less of the coloring substance.

Potassium Iodide and Codeine Sulphate.

(D. and Z.) ask if a chemical change takes place when this prescription is compounded:

Ammonium muriate	1 dram
Potassium iodide	1 dram
Codeine sulphate	10 grains
Syrup wild cherry	2 ounces
Syrup tolu	3 ounces
Water, enough to make	6 ounces

Yes. Potassium iodide is incompatible with codeine sulphate, an insoluble compound being precipitated. The mixture should not be dispensed.

Pressure of Gas in Steel Soda Water Founts.

(D. and Z.) You can easily draw soda water from your apparatus by placing the steel tanks containing the carbonated water directly underneath in the basement. Experienced "soda chargers" inform us that the distance of 12 feet or so between the tank or fount and the apparatus makes but little difference in the practical operation of the soda fountain. See that your pipe connections are all right, each coupling being properly washered and screwed up tight. The tanks containing the water should be charged to about 165 pounds.

Bleaching Cotton Goods.

(D. & Z.) want to bleach a piece of dark brown cotton goods so that it may be dyed a lighter color.

We have no knowledge as to the character of the dye used in coloring the goods dark brown, but it is quite likely the following process may answer your purpose: Make a strong solution of chloride of lime (bleaching powder) in water, allow to settle, and draw off the clear liquid. Rinse the goods in clean water containing about 5 per cent. of sulphuric acid, and then pass them slowly through the bleaching solution. They should then be well rinsed in water containing a little carbonate of soda. To remove all of the color it may be necessary to allow the cloth to remain for a short time in the bath.

Witch Hazel Liniment.

(C.) We know of no specific formula under this title. Distilled extract of witch hazel is often used either alone or in combination as a lotion or embrocation, and sometimes the tincture or fluid extract is combined directly with other liniments. Here are some formulas:

(1)	Spirit of ammonia	5 parts
	Camphor	2 parts
	Tincture of capsicum	5 parts
	Alcohol	34 parts
	Distilled extract witch hazel	10 parts
(2)	Fluid extract witch hazel	2 ounces
	Soap liniment, U.S. P.	14 ounces
(3)	Fluid extract witch hazel	1 ounce
	Laudanum	1 ounce
	Liniment belladonna	3 ounces
	Dilute alcohol	3 ounces

The preparations made from the first two formulas may be used for internal administration in doses (diluted) of ten to thirty minims.

Grammar of the Pharmacopœia.

(E. I. S.) wishes to know if the grammar of the U. S. P. title "Opii Pulvis" is correct. This is translated in the English title as "powdered opium." In our opinion one or the other of these is incorrect, for they do not correspond. "Opii Pulvis" is to be rendered "powder of opium." "Opii" being the genitive case (or possessive), and "Pulvis" in the nominative. "Powder of opium," therefore, is not correctly rendered by "powdered opium" as the English equivalent. To make the Latin fit the translation both Latin words should be in the nominative case, but, on the other hand, to make the English fit the Latin, it should read "powder of opium." But this powder of opium is not classed among the U. S. P. powders, and we believe the title should be altered so as to read "powdered" instead of "powder of." Perhaps the members of the Revision Committee can show us to be in the wrong in this reasoning, and we suggest that you communicate with them.

Essence of Ratafia.

(L. C. S.) "Ratafia" is a term applied to a flavoring essence, the basis of which is essential oil of bitter almond. According to one authority, peach kernels are properly the source of ratafia, but any of the other substances yielding bitter almond oil is used. The name "ratafia" is also applied in France as a common generic term to a variety of liqueurs compounded of spirit, sugar and the odoriferous and flavoring principles of vegetables, more particularly to those liqueurs containing the juices of recent fruits, or the kernels of apricots, cherries or peaches. De Brevan says the term is applied very loosely, but almost all of the liqueurs made by infusion are known under the name "ratafias," this method of preparation being applied to some substances, where it is impossible to extract the perfume by distillation with either alcohol or water. In the formula for "dry shampoo" (Era Formulary No. 2,128), where essence of ratafia is directed, you may use essence of bitter almond or any suitable odoriferous substance.

Iodo-Ferrated Cod Liver Oil in Capsules.

(H. S. S.) To fill capsules with a mixture of ferrous iodide and cod liver oil you should first dissolve the ferrous iodide in the oil by means of heat on the water bath and filter. This process is, however, open to some objection, as the product is not always uniform. Dieterich proposes a method by which anhydrous ferrous iodide is formed which dissolves easily in cod liver oil. His method is:

Iron, in fine powder	2 parts
Iodine	4 parts
Ether	10 parts
Cod liver oil to make	1,000 parts

Triturate the iron, iodine, ether and 40 parts of cod liver oil together until a black mixture results. A sufficient quantity of oil is then added to make 1,000 parts. The product should be filtered. It contains about 5 parts of ferrous iodide to the 1,000 of oil. Of course the quantity of ferrous iodide in the above can be adjusted to strength desired. The filling of capsules with the oil is quite easily accomplished in the usual manner by means of a pipette.

Cathartic Elixir.

(D. & Z.) An elixir containing the substances in the proportions you name may be made as follows:

Cascara sagrada	2⅜	ounces
Senna	1⅛	ounces
Blue flag	1	dram
Dandelion	½	ounce
Butternut bark	½	ounce
Licorice root	½	ounce
Rochelle salt	1⅛	ounces
Sodium sulphate	1½	ounces
Alcohol	1	ounce
Water	q. s.	
Simple elixir, enough to make	1	pint

Reduce the crude drugs to a coarse powder, and exhaust with boiling water, to obtain about nine ounces of the infusion, and cool. Add 1 fl. ounce alcohol, and allow the mixture to stand for a while (about 24 hours): pour off the clear liquid, and in it dissolve the Rochelle salt and sodium sulphate. Add enough simple elixir to make 1 pint. The menstruum of this preparation must be largely aqueous in order to dissolve the salts. Or, if desired, an elixir may be made from the fluid extracts of the crude drugs, after the process for compound cathartic elixir of the National Formulary (No. 45, Revised Edition). These preparations are never clear or transparent, should never be filtered, and they should always be shaken whenever they are dispensed or administered.

Flashlight Powder.

(J. S. K.)

1.)	Magnesium powder	6 ounces
	Potassium chlorate	12 ounces
	Antimony sulphide	2 ounces

Mix them. Use from 75 to 150 grains of the mixture at a time.

2.) Purchase 1 ounce magnesium powder and 1 ounce of negative gun cotton from dealers in photographic material; place on a dustpan enough cotton when pulled out to measure 3½ inches in diameter. Sprinkle it over with 20 grains of magnesium powder, to form a thin, even film. Lay over the magnesium thus arranged a very thin layer of gun cotton. Connect to the bunch of cotton a small fuse of twisted cotton about 6 inches long, so that it will extend to the side of the dustpan. Then set the pan on a step-ladder near the object, and, when ready, light the gun cotton fuse with a match, when instantly a brilliant flash will ensue.

3.)	Chlorate potassium	25 parts
	Yellow prussiate potassium	3 parts
	Sugar	2 parts
	Aluminum powder	10 parts

Hair Curling Preparation.

(W. H. S.)

1.)	Carbonate potash	2 drams
	Water of ammonia	1 dram
	Glycerin	4 drams
	Alcohol	12 drams
	Rose water	18 fl. ounces

Mix together. Moisten the hair; adjust it loosely, when it curls upon drying.

2.)	Saccharated solution of lime	2	drams
	Mucilage of acacia	4	drams
	Essence of rose	½	dram
	Water, to make	6	ounces

3.) Mucilage of quince seed may be used as a bandoline, or tincture benzoin with a little washed sulphur and oil of sweet almonds.

4.) Make a thick mucilage of gum tragacanth in rose water. Add a small quantity of salicylic acid dissolved in alcohol as a preservative agent.

5.)	Borax	2 ounces
	Gum arabic	1 dram
	Hot water (not boiling)	1 quart

Mix and as soon as the ingredients are dissolved add

	Spirits of camphor	1½ ounces
6.)	Resin	8 grains
	Alcohol	4 ounces

Dissolve and add perfume q. s.

Precipitates in Fluid Extracts.

(A. A. J.) You ask if precipitations in fluid extracts materially change their value, and whether such precipitations cannot be prevented. To answer these questions we would have to publish all that has been written, and it is a vast amount, during many years past. In brief, however, the cause of precipitation in fluid extracts is often the choice of a menstruum or solvent of a strength not exactly adapted to the drug. Or, too, precipitation may be a natural characteristic of some of the principles present, or because of chemical changes undergone through keeping of the drug, or through exposure to light or air. Then, accidental additions may cause alterations of this character. In fact, the range of causes of such precipitation is an extremely wide one. Sometimes the turbidity or precipitation is of no particular significance, as such sediment consists of indeterminate, inert, organic substances of no therapeutic value. But sometimes there is a separation of active principles, perhaps precipitation of glucosides, albuminous constituents, gummy or resinous substances, which may be of value. It is impossible to make a statement which will apply to all fluid extracts in general. It can only be determined whether a certain precipitate in a certain fluid extract is detrimental to the value of the preparation by examination and tests alone. In some fluid extracts a certain amount of precipitation is advisable, and often necessary, but in others it would be a serious injury to the product. Precipitation can only be prevented by a careful study of each drug upon which you work, of its constituents, their value, their solubilities, etc., and by careful selection of the proper menstruum for percolation and attention to the future steps of treatment, etc. You will find more or less upon this subject in the Dispensatories and works on practical pharmacy, and particularly in the A. Ph. A. Proceedings, of past years.

Bismuth Subcarbonate Insoluble.

(N. W. P.) Bismuth subcarbonate is insoluble in the following mixture:

Strychnine sulphate	1 grain
Bismuth subcarbonate, of each	1 dram
Elixir calisaya, enough to make	8 ounces

In the preparation of soluble bismuth mixtures, the ammonio-citrate of bismuth is generally used. It is a soluble salt, and may be used in either alkaline or neutral mixtures. Acid mixtures, of course, cause it to be precipitated. We suggest the following modification of the above formula:

Strychnine sulphate	1 grain
Ammonio-citrate of bismuth	64 grains
Distilled water, hot	2 drams
Quinine sulphate, of each	1 dram
Detannated elixir of cinchona, N. F., enough to make	8 ounces

Dissolve the bismuth salt in the hot water. In 6 ounces of the detannated elixir of calisaya dissolve the alkaloidal salts, adding to this solution the solution of bismuth, and, finally, enough detannated elixir of cinchona to make 8 ounces. Each fluid dram contains 1 grain of the bismuth salt, 1-64 grain strychnine sulphate and nearly 1 grain of quinine sulphate.

The Explosive Properties of Acetylene.

Progressive Age (Jr. Frank. Inst.) prints the following abstract of some experiments recently completed by Messrs. Berthelot and Vielle, which show that considerable precautions are necessary in dealing with acetylene, particularly in the compressed state. The gas in question is an endothermic body; that is to say, a quantity of heat is liberated on decomposing it into its constituents, hydrogen and carbon. Reasoning on this basis, the experimenters determined to try whether the gas could not be detonated by means of a cap of fulminate of mercury. This proved possible, though at atmospheric pressure the explosive wave did not proceed throughout the body of the gas, the decomposition being limited to the immediate neighborhood of the detonation. When, however, the gas was compressed, the experiments showed that it might prove a dangerous explosive. In fact, it was not then necessary to use a detonator, as it was found that the mere heating of the gas by an incandescent platinum wire was sufficient to cause an explosive decomposition of the acetylene. Average figures from a number of experiments made with different degrees of initial compression showed the following rises of pressure:

Initial Pressure. Lbs. per Sq. In.	Maximum Pressure Observed on Explosion. Lbs. per Sq. In.	Ratio.
31.7	138.7	4.4
49.4	271.0	5.5
85.1	600.0	7.0
160.0	1,312.0	8.2
301.0	3,028.0	10.1

On opening the steel test tube after an experiment, it was found to be filled with a mass of finely divided carbon agglomerated together by the increase of pressure. The rise of temperature at the moment of explosion was considerable, and in the case of the last of the experiments, referred to above, amounted to as much as 2,750 degrees C. It was, moreover, found possible to detonate liquefied acetylene in the same way, a pressure of over 35 tons per square inch being then attained. The explosion was started, as in the previous cases, by means of a white-hot platinum wire. Dropping a bottle of the liquefied gas, or allowing a heavy ram to fall on it, proved insufficient to detonate the mixture, although when the bottle was broken by the ram a violent explosion occurred. This, however, arose from the combustion of the gas, and thus differed materially in nature from the experiments previously made, in which the acetylene was merely resolved into its elements.

The following data, bearing on the behavior of acetylene, are credited to the investigations of M. Brevan:

"If ordinary acetylene from carbide be passed through a series of three washing flasks containing a solution of sulphate of copper, there is no effect perceptible within three hours; but after twelve hours the first flask contains a black-brown, brilliant precipitate, the quantity of which goes on increasing for as much as eight days. This precipitate explodes on shock, friction or heating; and it appears to be a mixture of phosphide and silicide of copper, of sulphate of cupro-acetyle, and a variable quantity of acetylide of copper. Its production appears to depend largely on the presence of ammonia in the crude acetylene gas; and it shows that the crude acetylene contains phosphoreted hydrogen and siliciureted hydrogen. The second flask contains a precipitate which is similar in appearance, but less explosive; and the precipitate in the third flask is not explosive. The explosive precipitate in the first flask will explode even under water, as, for example, when we try to rub it off the glass with a glass rod.

"As to the explosibility of acetylene there are two opinions: one, that there may be metallic acetylides formed, which act as detonators to the acetylene itself, so that acetylene cannot be used with reservoirs which are capable of being attacked by it; the other, that it can only be exploded when mixed with air, and that the influence of the outside explosions which can set it off cannot travel far through air. In any case, acetylene, at a pressure not much exceeding that of the atmosphere, is not explosive, though it is explosive at pressures above 2 atmospheres; so that there is no reason to fear an explosion through flame running back to a reservoir under a very small excess of pressure. Shock alone does not appear to cause explosion of the gas, only of the acetylides. The alleged poisonousness of acetylene—which has not, as yet, given rise to any accident—would appear to be due to the occasional presence of cyanogen compounds, and is not a feature of pure acetylene. The presence of sulphureted hydrogen in acetylene seems to depend on that of sulphide of aluminum in the carbide of calcium; sulphide of calcium may exist in it without forming this impurity. The blocking of gas jets by acetylene flames seems to be due to the formation of phosphoric acid. If oxygen be not present, acetylene does not attack copper; the oxide must be formed before the acetylide can be produced."

FOSSIL BACTERIA.—M. B. Renault has long worked at the indications of bacteria found in geological strata, and now publishes the general result of his observations in a paper illustrated with a large number of drawings. As might be expected from their simple structure, bacteria appear to have been co-eval with the first appearance of organic life on the earth, the coccoid form being apparently earlier than the bacillar. Indications of their presence are found in bone, teeth, scales, and coprolites, as well as abundantly in vegetable tissues, the spores and sporanges of ferns appearing to have been especially subject to their attacks. The species are, as a rule, distinct from those at present in existence.—Ann. des Sciences Naturelles (Pharm. Jour.)

THE PHARMACEUTICAL ERA

[*WEEKLY.*]

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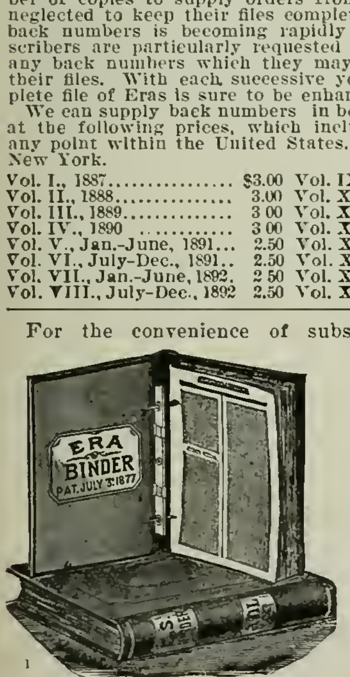


The N. W. D. A. on Substitution.

Elsewhere in this issue is printed a circular which has been distributed to all wholesale druggists by the chairman of the Committee on Proprietary Goods of the National Wholesale Druggists' Association. Its importance demands for it the most careful consideration of the trade, for a principle of justice is involved, the question whether a man has a right to his own.

It is sometimes difficult to determine where to draw the line between a so-called legitimate and illegitimate imitation or substitution of a proprietary article, but here is a case where, it would seem, it should not be a hard task.

For the integrity of the trade, for the maintenance of the best standards of business morality, for protection against a vital evil, the circular issued and the stand taken by the N. W. D. A. committee are most commendable. Every man has a right to the fruit of his own brain. The patent medicine man has his rights. If the wholesale trade will enforce in every instance, in every direction and to the utmost extent the principle set forth in this circular letter it will do much to crush the evil of substitution.

For One State Board.

The opposition to the pharmacy section of the proposed Greater New York charter is crystallizing into definite effort, and as was prophesied, this effort is to secure the abolition of all local boards of pharmacy and replace them by one general board which shall represent the entire State. Assemblyman William L. Perkins, of Brooklyn, has undertaken to introduce into the Legislature a bill drawn up by a number of Brooklyn druggists to accomplish this end. In general, the bill follows very closely certain suggestions contained in the editorial in this paper last week, except that it makes the whole membership of the board seven instead of eleven, as follows: From New York County, 2; Kings County, 1; Erie County, 1, and the State at large, 3.

The bill provides that the Governor shall name the board from a list of candidates containing double the above number of names recommended to him by the New York State Pharmaceutical Association. It also provides that $2 shall be the fee for the reregistration of druggists already registered, and that there shall be no renewal registrations. The examination and registration of a pharmacist by the new State board are to cost $10, and of an assistant pharmacist, $5; in order to secure registration they must have had, respectively, four years' and three years' practical experience in drug stores. The examiners are to hold sessions at the Capitol, in Albany, at least every three months. The funds obtained by the State board from registrations, fines, etc., are to be applied to the prosecution of violators of the pharmacy law. A modern poison law, an improvement on the present Kings County law, is also a feature of the new bill. Two hours is made the maximum period during which a licensed pharmacist may leave his store in charge of an unlicensed clerk, who may not, however, put up prescriptions during this temporary absence of his superior.

Mr. Perkins, on March 19, also introduced into the Assembly an amendment to the Greater New York charter, apportioning the returns from the registration of pharmacists in Greater New York, as follows: To the New York College of Pharmacy, three-fifths, and to the Kings County Pharmaceutical Society, two-fifths. This amendment is merely meant to emphasize the protest of the Brooklyn druggists against the pharmacy sections of the proposed charter. It is not introduced with any expectation of seeing it pass, it is said. The bill abolishing all boards of pharmacy in favor of a single new State board is, however, expected to be put through, if not at this, at some succeeding, session of the Legislature, and will be pushed with all the power of the Kings County and German Apothecaries' Societies, with whatever allies they can secure in other sections of the State. The Brooklyn druggists expect to capture the State Pharmaceutical Association at its next meeting at Manhattan Beach. With the backing of this representative State body, the proposed new law stands a very good chance of passing.

Keep Animals Out of the Drug Store.

We must file our protest against the increasing use of animals for advertising medicines. There is something about almost every animal which does not appeal favorably to the finer sensibilities of refined people, and much less to sick people. We noticed recently a picture of a pig with a baby's face, to advertise the fact that a certain medicine would make the babies as fat as pigs. It strikes us that such an advertisement has just the opposite effect to that intended, and would prejudice any fond mother against giving this medicine to her baby. It is quite the fad for some manufacturers to fill up the druggist's show windows with animals. The glittering little gold fish in his water home has long been used in the drug store as a pleasing attraction, and the voice of the canary or the mocking bird is not unpleasant to visitors, but to fill up one's show windows with frogs, or snakes, or alligators, or mud turtles, or guinea pigs, or in fact any kind of an animal that is repulsive to delicate natures is the last thing that ought to be permitted in a drug store. The drug shop, like the sick room, should be made as pleasant as possible, so do not drive customers away by turning your show windows into a menagerie. There are enough pleasant things one can employ which will bring trade, and leave a good taste in the customers' months.

Any druggist will act wisely if he follows the rule of never permitting anything in his store for advertising purposes which, in the slightest degree, produces an unpleasant sensation or is repulsive to the most delicate and refined natures. Such are not fit subjects for drug store displays.

Live Advertising.

That "Great is advertising" cannot be gainsaid. Its mission is to inform, and, to manufacture a Hibernianism, advertising which does not do this is not advertising. It may be accepted as an incontrovertible proposition that advertising pays, but then it must be real advertising. Every one advertises, the lawyer, the clergyman, the banker, the physician, the circus man, every tradesman, every artisan. In every walk of life, in every vocation, advertising, the striving for publicity, is the very life-blood of our existence. The subject is one for endless discussion; it never can be exhausted. We, therefore, do not attempt its general consideration, but do feel impelled to say a few words regarding one particular phase of advertising which comes close to us.

The popular conception of advertising is the purchase of space in a publication, by some one who has something to sell, in which space may be described the virtues and excellencies of that something. The advertiser expects that his returns will at least be sufficient to cover the cost of this space. If it brings more, it pays. There are two causes for either failure or success; for the first, bad goods or bad advertising; for the second, good goods or good advertising; permanent success requires both the latter. Presuming the goods are all right, the question of letting people know about them at once assumes huge proportions, and right here is where good common-sense and keen business sagacity must be exercised. See that the advertising is right.

Advertising must be worth reading; it must be of the right sort to pay. The most successful merchants are the largest and most original of advertisers. The great department stores make their advertising their leading drawing feature, and study the question very closely. Every day their advertisements are changed and the public has been educated to expect and look for their daily announcements. Every woman scans the ads. in the newspapers most carefully before setting out for her day's shopping, and decides from what she reads where and what she will buy. This change of copy is the secret of the success of this advertising. The readers watch for the new announcements of bargains, novelties, etc. In other words, this purchaser of advertising space uses it to the best advantage and tries to make it profitable.

This example and method can well be followed by drug trade advertisers. Many have recognized the opportunity which is offered them by the advent of the weekly drug journal, and are improving it by changing their copy every issue. And they find that it pays, too. There has been a campaign of education with regard to drug trade advertising during a few years past, as well as in other lines of trade, and jobbers and manufacturers are realizing more and more that the day of the "standing ad," unchanged from month to month, a mere announcement that they are in business, has passed. They are making a study of this question and use their space to tell their present and prospective patrons what they will like and should know. Fresh ads., changed every week, now constitute a feature of this paper, which is a radical and most satisfactory departure from the hoary-headed and time-dishonored methods which have too long burdened drug trade journals. When such successful, leading houses as those which now use the Era for their live weekly announcements find, as they do at once, that this kind of advertising pays, it must be conceded that it is good advertising. And that is the object of all advertising—that it shall pay.

A word to the readers of this paper. Scan the advertising pages regularly. They are full of news of just the kind which will help you to make your business profitable. They will keep you promptly informed of things you ought to know and will bring dollars to you.

The Proposed Tariff Changes.

The retail druggist is just as much interested in tariff legislation as any other business man in the community. An advance in the tariff rates on goods he has in stock increases his wealth just that much, and an intimation of impending advances may save him a considerable sum of money, provided he is in a position to buy promptly. We print this week a complete table showing the changes in the duties on drugs and chemicals contemplated by the new Dingley tariff bill.

In general the trade favor specific duties rather than ad valorem, and the changes in the drug schedule seem for the most part to be in the direction of this reform. After all, the best interests of the trade will be served by promptness in this matter. There is nothing on earth so expensive as uncertainty. Let the nation's lawmakers do whatever must be done quickly. We have been waiting long enough for public confidence to be restored.

Edward C. Frisbie.

Edward C. Frisbie, head of the Hartford wholesale drug house of Talcott, Frisbie & Co., has fighting blood in his veins. He lives in a handsome brick house in the suburbs of Hartford, and his neighbors out there have not yet got over telling about the time he shot a burglar who tried to ply his vocation at Mr. Frisbie's expense. The incident also shows that the quality of courage for which Mr. Frisbie is distinguished has been handed down to his daughter, Miss Florence, a young lady whose charms brought her a host of friends at the recent convention of the National Wholesale Druggists' Association in Philadelphia.

Miss Frisbie, who was a school girl when the adventure occurred, was abruptly awakened one night by a masked burglar, who at the muzzle of a revolver, in the most approved story book style, demanded that she arise and show him where the valuables of the family were kept. It might be too much to say that the girl was not frightened, but she certainly was not terrified, for she at once set about scheming how to call her father. The burglar, meanwhile, to better enforce his commands, had seized her by one of her wrists and dragged her toward the door of her room. Accordingly she set out apparently to guide him to the treasure he sought, but really to lead him down the stairs past the bedroom in which her parents were sleeping. Arriving there she screamed, "Papa!" at the top of her voice till the burglar's hand stopped her breathing, and then she kicked the wainscoting with her bare feet till her father appeared. The burglar fired an ineffectual shot and dashed down the stairs. Mr. Frisbie, though awakened out of a sound sleep, was equal to the emergency. He secured his revolver and managed to get one shot at the fleeing burglar before the unwelcome visitor disappeared with an accomplice in the direction of the railroad track, a few blocks distant. But that shot resulted in the capture and identification of the scoundrel, the bullet having passed through the burglar's leg. The cracksman proved to be a desperate character, who had killed several men. He was himself shot and killed in an effort to escape from prison a few months afterward.

Mr. Frisbie began business life as a retail drug clerk. He was born in Hartford, March 1, 1852, and educated in the public schools. His first position was in Daggett's Pharmacy in New Haven. Soon, however, he was wielding the pestle in Sikes & Newton's (now Newton's) Pharmacy in Hartford. He began to study the wholesale trade as an employé of Talcott & Co., in 1874. This house, which had been founded in 1851, by Seth Talcott, had been successively Talcott & Fuller, Talcott Brothers and Talcott & Co. In 1883, Mr. Frisbie having been admitted to the firm, the present name was adopted. Mr. Talcott died in 1894, leaving two sons. The entire management of the business devolved upon Mr. Frisbie at that time. It will be seen that Mr. Frisbie's advancement has been extremely rapid, and as he is still a young man, there is every reason to anticipate for him a brilliant career. He has several times been approached by politicians with the request that he run on the Republican ticket for the office of Mayor of Hartford, but has thus far resisted their importunities. He is also a conspicuous figure at the meetings of the wholesale druggists, where he has championed the cause of free alcohol. In making an address Mr. Frisbie is very brief and to the point, and he carries conviction by the directness of his logic.

He was married in 1873, to Miss Wiley, of Hartford, a delightful woman. He has one son and two daughters. His home is one of the most beautiful in Hartford.

Correspondence.

We are pleased to publish here communications from our readers on topics of interest to the drug trade. Writers are requested to express their views as briefly as possible. Each article must be signed by its writer, but his name will not be published if so requested.

Reply to the Doctor.

Philadelphia, March 16.

To the Editor: May I answer the writer who so ably defends dispensing by the doctor in your issue of March 11.

First, he says, "Substitution is practiced to an alarming extent;" truly he is unfortunate in his associations! Does he mean that of all professions the druggist is the most dishonest? Are the majority so beneath their fellow men that they deliberately and continually change a doctor's prescription ,thereby endangering the lives of their best friends—their customers? Does not the old adage, "Honesty is the best policy," apply to pharmacy? Verily, doctor, you've unconsciously placed a respected profession among the Shylocks of humanity.

Second, "Repetition of Prescriptions." Who is to blame for this? How many doctors write "Please renew," when they want a prescription refilled? They simply say, "When this is all taken have it renewed," thus teaching the patient that the prescription is his own property, to do with as he pleases, and the courts have so decided. If the doctor is really anxious to prevent "actually harmful effects from renewals," let him so impress it upon the patient and write, "Do not renew" upon the prescription.

Third. "Omission of drugs." We have answered this in our first paragraph. An honest man never cheats by commission or omission.

Fourth——?

Fifth. "Error in compounding." The doctor, of course, cannot err (though why he omitted reason No. 4 I cannot say), and who would correct him if he did?

The system of checking off the work of each other, practiced in most stores, reduces liability to error to a minimum.

Sixth. "Loss of time to the patient." How many of your patients, doctor, need medicine instantly? Only extreme cases, and a very limited number of drugs will suffice to meet these emergencies. These remedies every doctor should furnish, but such cases form a small part of his duties.

Seventh. "Knowledge that the druggist obtains of the disease prescribed for." Our customers have the same confidence in us as in their physicians, and in ten years' experience I never heard one object to our knowledge of his trouble. Quite the contrary, the most private cases, as a rule, make us their confidant and ask if the prescribed remedy is a good one.

Eighth. "Knowledge the patient obtains of the remedy." If he hasn't confidence in his physician he may object to his remedies. Only the ignorant cause trouble of this kind, and it can easily be avoided by writing the prescription in Latin. Let the doctor study synonyms, and very few can tell what he orders. If a "placebo" is desired, it is the easiest of all remedies to disguise.

Ninth, "Financial loss to the doctor." He says, "The patient pays the druggist, and the doctor must wait." Here again the doctor is to blame. He educates his patients to pay once in six months, and the druggist demands cash. It would be only a short time when the "doctor-druggist" would be charging medicine and services too. Insist upon cash for all your work, and as an inducement a lesser fee, and you'll not need to be a "jack of all trades" to live.

Now the greatest advantage to a doctor in writing prescriptions is the unlimited remedies from which he can draw. If he carries his own stock it is necessarily small, and he is constantly substituting what he has for what he wants—a crime for a druggist but a virtue for a physician! A busy doctor has no time to make pills, suppositories and emulsions. Imagine Agnew, Flint or Da Costa leaving their office to make one dozen three-grain valerianate of iron pills! The fact that a doctor does it is a confession of inability to live without it. Why not shoe his horse, mend his buggy, or paint his house for the same reason?

The best in medicine is none too good, and the best can be obtained only by sending a patient with a carefully written prescription to a conscientious graduate in pharmacy. Let doctors use every aid to cure the sick, do all they can not to injure but to aid their best assistant and closest friend—the honest druggist.

H. B. MORSE.

WINDOW DISPLAYS.

By JOSEPH F. HOSTELLEY.

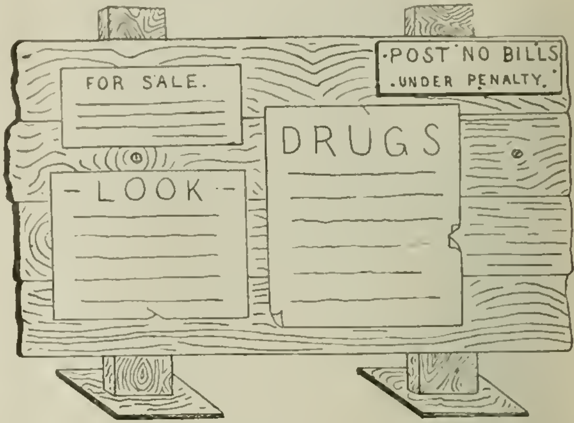
It is not always the most elaborate or costly display that attracts the most attention. Oftentimes the attraction is due to some oddity which may even approach the grotesque. It is to these oddities that this article will be chiefly devoted.

Display No. 1 consists of sponges, depicting their gathering from their native haunts. From narrow strips of one-fourth inch board make a frame 4 feet in height and corresponding in length to the width of the window. Shape white muslin into one piece 4 feet by the length of frame, plus the depth of window taken twice. Thus, were the frame 7 feet long and window 3 feet deep, the size of the muslin piece would be 4 feet by 13 feet. (This material can be had for six or eight cents per yard). On this muslin draw with light blue chalk a representation of how you would conceive the sea to appear could you view it vertically from the bottom to the surface. Some light blue fabric might supersede the muslin and answer all requirements. The top of the piece is cut in undulated lines in portrayal of the billowy surface. When completed this is fastened by small tacks to the framework, leaving the margin at either end representing depth of window. Stand this scene in the window, at back, and fasten the marginal pieces to the front posts. Cover the floor with sand heaped into numerous small hillocks and lay upon this a few shells, pieces of stone, rotten wood, etc. Now, on a level with the sea surface suspend by a fine thread, from whatever point is convenient, a miniature rowboat, say a foot long, place in it a doll divested of all raiment, with the exception of a loin band, and another similarly clad figure is made to appear as if searching for sponges at the bottom. About the rocks place some sponges and half fill the boat with small ones. Some fish apparently swimming about would enhance the effect. An accompanying placard might read: "Nerve and physical endurance are here taxed to their utmost. The prices of our sponges, however, are not governed by the difficulty in procuring them."

The figurative ideas of many advertisers employed literally:

First cut from a 3x4 joist two pieces each 5 feet long. To one end of each nail a piece of board 18x18 inches to serve as a base. Rough boards, in length equal to the breadth of the window, are fastened to these in representation of a section of fence (see cut.) The boards may be painted if desired, but this is not essential.

With your stencil print in poster style whatsoever you wish to say concerning seasonable preparations or sundries. Then paste these advertisements consistently on the fence section. This may be given a more realistic aspect by affixing an injunction to "post no bills under penalty." This accomplished, the framework is set in the window, well toward the back, and a ground work of green saw dust is spread to a sufficient depth to cover the bases of the posts. A doll or two arranged from the back to appear as if looking over the fence (you have these from display No. 1) and a few large stones on the ground, with perhaps some broken twigs, aid in the reality. Should you wish to further this end, on a piece of white muslin the height of that portion of the window visible from the street, and wide enough to hide the ends of the boards, sketch with green chalk a trunk of a tree—as used for side scenes in play houses—and hang it a few inches in front of the fence and touching the side of the window. Then similarly treat the other side. This gives the fence a partial excuse for not being further visible.



Stationery.—To one of the posts used in the former display, and which still retains its base, attach a previously lettered board, say 12x16 inches, which at a casual glance might be taken for one of the inevitable notices of property for barter, but which in reality proclaims the following: "For Sale—A large lot of stationery—inquire within." With the exception of the foregoing notice and possibly a carpet of green saw dust the window is left bare. If fortunate enough to possess two or more windows, attention might be called to an article elsewhere displayed, doubling the effectiveness of your work.

Corn Cure.—The post may be found serviceable in still another way by removing the board of the previous exposition and attaching one say 3 feet long by 4 inches wide to form a T. The ends of this strip are shaped to represent a pointing hand, or this may be drawn with crayon. On one arm of the T print the name of some legendary town and distance thereto, and similarly treat the other arm with the title of a different town. Just below this nail a small sign inviting notice to your cure for corns, giving space to your name and address. After the post has been stood in the window, and the usual ground work added, a brownie or other figure, in one hand of which has been placed a small cane and bundle, is stood facing the sign. The size of this figure is to be governed by the outlay the druggist may care to put into it. A large one is desirable, however, and it can be advantageously used in many exhibits. Such an accompanying card to the public pasted on the window might prove apropos: "Is it his corns that trouble him?"

Bird Seed.—A prerequisite of this display is that a portion of the work must be done several weeks previous to its appearance. Having obtained a liberal amount of moss with a quantity of moist earth attached, sprinkle freely with bird seed and set aside to sprout, keeping moist the while. Lawn grass seed would likewise answer the purpose. When the blades of grass have assumed a desirable height the exhibit may be made. The window space is first divided into thirds (if a large window, into half), two thirds of which is to represent a field of growing seed. Out of old boards make a small hill, at the foot of which deposit several pieces of broken stone; cover the entire two-thirds with the grass covered earth clods and pack closely around the rocks. In the remaining space pile the boxes of seed to a considerable height. If thought desirable, an accompanying card may prove fitting, as "It's easy to raise, but would you care to gather it at 10 cents per box? That's the price."

Soap.—An aid to a soap display might consist of two towels, hung in a conspicuous position, one of which bears evidence of having been used by a careless washer, the other immaculately clean. The former can be given its unsightly appearance by immersing the hands in a dilute solution of shoe blacking, or other suitable substance, and wiping them on the towel, leaving the imprint of the open hand in several places. On this towel is pinned a card suggesting that there was "None of Smith's toilet soap used here;" while on its companion appears the legend: "There was here, however."

Miscellaneous.—On a board frame of any size desired (the size of the window and ideas of the "dresser" regulating this) is pasted—or otherwise attached—colored paper or cloth of a pretty but not gaudy nature, and on this again is pasted in an artistic design a representative number of all the labels used in the store, from spirits of camphor to brick wash. Should your labels be of an attractive nature, and they doubtless are, this will make a catchy display. Several colored stickers or cork tops may be effectively distributed among the assortment. One glancing at this heterogenous list would many times recall some article needed and straightway a sale would be made. After standing this bulletin board in the window several articles mentioned thereon are assembled about it.

(Special Correspondence.)

PHARMACY IN AUSTRALASIA.

Sydney, N. S. Wales, Feb. 15, 1897.—The absorbing topic is Federation Every other legislative question is lost sight of for the present and will remain in obscurity till the middle of the year, when the Convention has concluded its labors and decided the second step in the Commonwealth. The first step was the Convention of 1891, when the draft bill—the basis of the work for the coming gathering—was agreed upon. The big scheme of National Union suggests the minor ones of professions and trades, and naturally enough the pharmacists are discussing informally the federation or reciprocal treaty of chemists and druggists over Australia, New Zealand and Tasmania. The more they discuss it the more difficult it appears to grow. In Melbourne, Victoria, where the only properly established pharmaceutical college exists, they are turning out pharmacists 50 per cent. faster than all the other colonies combined, and this is, in a measure, accounted for by the fact that the Melbourne college is handsomely subsidized by the Victorian Government. The standard of pharmaceutical education is considerably higher in Melbourne than in any other of the colonies, and the Victorian Board of Pharmacy insist that in any scheme for federation their standard must be adopted. Very properly, they refuse to lower it to suit their neighbors, who are not subsidized, and however much they might wish to climb to the Victorian pedestal they find it impossible to raise colleges equal to Melbourne in laboratory convenience, professional tuition and general accessories. The cry is mouthed that too many pharmacists are being manufactured in the Queen City of the South; that competition is becoming too keen in consequence, and that the Melbourne college must be conducted without a State subsidy. On the other hand, it is sensibly argued that the maintenance of a high standard—higher even than it is now in Victoria—would provide the only panacea for those who are afflicted with keen competition and the fear of the practical application of the maxim, "The survival of the fittest." Viewed from a public standpoint, many of the old school of pharmacists, those who are troubled about competition, would be conferring a benefit to the community if they retired altogether in favor of the well-trained and educated modern pharmacist.

The Victorian Pharmacy Board has decided not to extend indefinitely, as hitherto, the leave granted to widows to carry on the businesses of their deceased husbands. The New South Wales Pharmacy bill—which it is expected will get through Parliament before the end of the year—has a clause of similar purport. The basis of the Victorian act and the N. S. W. bill is the direct individual responsibility of qualified persons. The Chemist and Druggist of Australasia, writing on this subject, says: "No manager, however free from constraint, can be so directly responsible as a principal, and every widow's shop carried on under the management of a qualified chemist is a violation of the spirit of the (Victorian) act. Such a violation may be benevolently winked at, in order that the unqualified inheritor of a business may not be compelled to realize at a sacrifice." Both the Victorian and the New South Wales boards have acted with clemency in the past, but the line must be drawn somewhere, or those who have been granted a concession as a favor may come to look upon it as a right.

The current issue of the Pharmaceutical Register of Victoria comprises 822 names, of whom 380 were registered through the privilege of being in business when the present Pharmacy act was passed in 1876; 280 qualified by examination, and 133 hold the British certificate, and the remainder are made up of 16 "assistants prior to 1876," and thirteen foreign and colonial certificates. Seven years ago the Register had 758 names. The number then on the Register "as in business before 1876" was 474; those registered on examination, 164, and British qualifications 105, as well as five assistants and ten holders of foreign diplomas. There have been 205 fresh registrations in that period; eighty-six of those registered "as in business" have died or disappeared as well as fifty-five others, or a total of 141, leaving a net increase of sixty-four for the seven years—this increase being almost entirely due to the number of young men who have qualified by apprenticeship and examination. The figures show an average annual decrease in the "in business" class of twelve, and the increase by examination seventeen. The "in business" people have an advantage now of just 100, but in three years, taking the percentage, both the old hands and the new will be equal in numbers. The New South Wales register bears the names of 491 pharmacists, or 331 below Victoria. There are so many illegally registered men on the N. S. W. list that it has been found expedient to leave out all mention of the qualifications; hence, the only qualifications set down are (1) "Carried on business prior to the passing of the Poisons act in 1876 and (2) admitted a pharmaceutical chemist."

Dr. Finselbach, Ph. D., of Lismore, New South Wales, has been interesting himself in the question, "Does Hazeline Contain Formaldehyde or Not?" and has submitted Extra. hamameli Virg. Stearns to analysis, and the reactions of formaldehyde were quite distinct.

(1) The extract mixed with chlorate of potassium solution reduced after adding a few drops of nitric acid, nitrate of silver—

$$KClO_3 + 3HCHO + AgNO_3 :$$
$$3HCOOH + AgCl + KNO_3.$$

(2) Reduction of silver in ammoniacal extract.

(3) Reduction of Fehling's solution.

(4) Formation of hexamethylentetramin.

He says he leaves it to some one with the necessary appliances to determine quantitatively the formaldehyde, and considers it would be an interesting physiological study to examine how far the antiseptic action of hazeline is due to formaldehyde.

Has the question of the ownership of prescriptions ever cropped up over your way? Our people out here don't seem equal to the solution of it. Some say the prescription belongs to the physician who writes it; others, it is the property of the patient who pays for it, while quite an army of pharmacists refuse to yield their claim. Just recently the Canterbury branch of the New Zealand Medical Association in entering a protest against the Medical Practitioners' and Chemists' act contains this remarkable paragraph: "Clauses 4 and 5 of the bill, re prescriptions and prescribing" (i. e., that English should be used in every case) "are objectionable and impossible, as most terms used have no English equivalent. It interferes with our rights as proprietors of the prescriptions; it is detrimental to the best interests of the patients and opposed to the existing practice which prevails throughout the world, as every chemist in the world understands the Latin, but only a moiety of them the English." British law as far as I know vests the ownership of a prescription in the patient. It comes as a surprise to hear that "most terms have no English equivalent."

At Perth, the capital of West Australia, on the 16th of December last, a coroner's jury gave the following verdict: "That the child came to his death from the effects of half a Steedman's soothing powder given by his mother, which powder probably was one containing an undue quantity of morphia." The inquiry attracted much public attention, as these powders are largely used in the colonies. The boy was nearly six months of age. Being restless, the mother gave him the powder after midnight, followed later by a dose of castor oil. Early in the morning he developed bad symptoms and before the mother could reach a doctor with him he expired. Dr. Spencer, of the Perth Hospital, made a post-mortem examination and found death had resulted from a narcotic poison. In giving his evidence Dr. Spencer said he was not aware that Steedman's soothing powders had a certain and constant composition; or, in other words, that each powder was mixed separately so as to make absolutely sure of its contents. If mixed in a large scale one powder might contain a surplusage of one ingredient, as was probably so in this case. The government analyst found the powders to be unequal in size, and one in particular weighed 3¼ grains and contained morphia not exceeding 1/20 part of a grain. He agreed with the doctor as to the danger of mixing such ingredients on a large scale.

From New Zealand we occasionally get some very original things. At New Plymouth lately a single woman —an old maid—had occasion to order a hawker from her door and he left muttering vengeance. The same night she was awakened by the fellow holding a chloroformed handkerchief to her nose, and being an active woman she grappled with him, threw him to the floor and completely turned the tables on him. She pinned him down and effectively chloroformed him. Then dressing quickly she went for the police and handed him over. This is not a "fake": it is an absolute fact and the scoundrel is now awaiting his trial.

Another New Zealand sensation implicates a young chemist named Carrol, belonging to New South Wales. Finding himself jilted he followed the lady and her new lover to Pareoa, near Auckland, and just previous to the hour appointed for the marriage he met them at their hotel and—so it is alleged—threw a bottle of sulphuric acid over his rival. He eluded arrest in New Zealand, but was captured in Sydney on the arrival of the New Zealand steamer and extradited much quicker than our notorious Butler is being handled in Frisco.

On top of these comes a third more thrilling piece of news from Auckland, N. Z. Dr. Bakewell wrote something about women's physical unfitness for Parliament and electioneering work, and one of the weaker (?) sex replied challenging him to a trial of strength in either a tug-of-war, weight lifting, boat pulling, running high jump or struggle for the possession of a marlin spike, and deposited $25 with the editor of the Auckland Herald for the match. She gave some of her measurements, height 5 feet 6 inches and weight 10 stone 4 pounds; but, true to the traditions of her sex, omitted her age. Dr. Bakewell replied accepting the challenge in a lily-livered fashion, suggesting that she might require handicapping, as he was sixty-five years of age and only weighed 10 stone. The lady insists on his acceptance of the challenge, or the forfeit of $25 to go to the Ladies' Benevolent Society. The result is awaited with interest.

Trade is very bad in Sydney. The pharmacists say the times are the worst ever experienced.

ACETONAL is an aluminium-sodium acetate.

COSAPRIN.—A new antiseptic. Owing to the insolubility of antifebrin and its toxic characters (cyanosis), Dr. Schwarz has endeavored to prepare an allied derivative which possesses its antipyretic properties alone and the advantage of solubility. The author has introduced the acetyl group into the sodium salt of sulphanilic acid, obtaining a crystalline compound which is very soluble in water, but slightly so in alcohol and ether.

ERGOTINOL.—A preparation of ergot introduced by Dr. Vosswinkel, which is prepared, according to Dr. Abel by exhausting powdered, de-oleated ergot with water, the aqueous extract after acidulating with hydrochloric acid, is hydrolyzed, then after neutralizing, subjected to alcoholic fermentation. After completion of this fermentation, the solution is dialysed, and the dialysate concentrated until 1 cc. of the ergotinol corresponds to 0.5 gm. of the solid extract of ergot. This new preparation is recommended as being free from all disagreeable side effects of ergot.

DETECTION OF NITRITES IN DRINKING WATERS.—Gawalowski (Zeitschr. f. Nahrungsm. Untersuch.) states that potassium iodide and starch paste are extremely sensitive reagents for the presence of nitrites. The iodide must be free from all traces of iodate, and should be kept away from light and air. The mixture of the sample of water and iodide should be acidified with hydrochloric acid (dilute), and not sulphuric; the starch paste which is added should be prepared fresh each time, first washing it with distilled water. A sample of starch which has been washed but has not been converted into a clyster until the following day gives a faint blue coloration with the reagent and water free from nitrous acid.

DETERMINATION OF PHOSPHORUS IN OLEAGINOUS SOLUTION.—Thirty drops of the solution of phosphorus in oil are brought into a Kjeldahl flask (300 cc.), weighed, and after placing at an angle, 20 cc. of fuming nitric acid are added from a separatory funnel, first allowing the acid to drop slowly, and after the violence of the reaction begins to subside, it is allowed to run into the flask in a slow stream. The flask is then placed on a cold water bath, which is gradually heated until boiling point is reached, and at this temperature the flask is kept for one hour. The excess of nitric acid is removed by heating with a direct flame, after which the contents of the flask are washed out into a platinum vessel with hot water and evaporated to dryness. The residue is treated with a solution of 3 gm. of sodium carbonate and 1 gm. of potassium nitrate, the clear soapy solution evaporated and the residue slowly ignited with addition of saltpeter. The fused mass is dissolved in water, boiled with a slight excess of hydrochloric acid until all of the carbonic acid and nitrous acid is driven off, then the fluid is examined in the usual way for the presence of phosphoric acid, which may be estimated quantitatively.

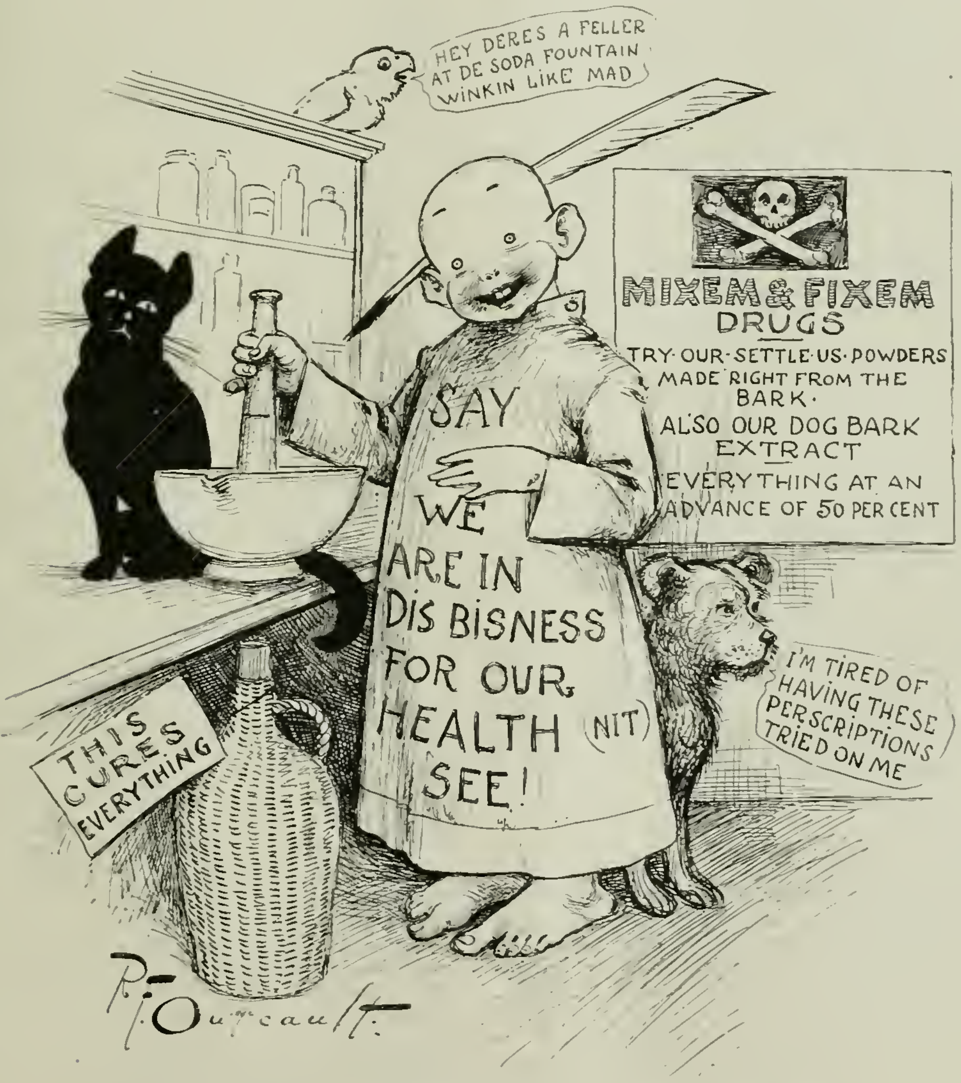
THE YELLOW KID IN PHARMACY.

The popularity of the yellow kid as a means of advertising chamois skin and other druggists' goods in both newspapers and show windows has attracted wide attention among readers of the Era. We are in receipt of numerous letters inquiring whether pictures of the yellow kid may be published without the permission of the inventor of this novelty. Inquiry proves that the artist, R. F. Outcault, of 150 Nassau street, New York, has copyrighted every picture of the yellow kid, and that permission to use such pictures must be purchased from him. Mr. Outcault has, however, upon request of the Era, drawn a picture for the special delectation of druggists, and we are pleased to produce it herewith.

Under the heading "Vice in Art," the Pall Mall Gazette, of London, recently published a column article about R. F. Outcault's yellow kid. It was a left-handed way of admitting such of the British public as have a sense of humor to the amusing performances of this precocious young American. The truth is that the yellow kid is nothing more nor less than an artistic joke, and the solemn British editor who cannot see the joke is beyond the reach of enlightenment.

The popularity of this original little harlequin in this country has naturally called attention to the author of his being. Mr. Outcault is a young man of medium height, brown-haired, blue-eyed and graceful. His mustache points turn up at an angle of 40 degrees. The angle of his wit is even more acute. He is the best mimic off the comedy stage. He can tell a funny story so as to convulse his hearers. It is said that the Journal, which employs him, pays him a salary of $10,000 a year, and that in addition he receives all the royalties he can collect from the copyrights on his productions.

Mr. Outcault was born thirty-four years ago in the Ohio town of Lancashire. He was trained to be an expert mechanical draughtsman, and did considerable work in that line for various trade papers. During the Cincinnati exhibition of 1888 some of his mechanical


HEY DERES A FELLER AT DE SODA FOUNTAIN WINKIN LIKE MAD
MIXEM & FIXEM DRUGS
TRY OUR SETTLE US POWDERS MADE RIGHT FROM THE BARK.
ALSO OUR DOG BARK EXTRACT
EVERYTHING AT AN ADVANCE OF 50 PER CENT
SAY WE ARE IN DIS BISNESS FOR OUR HEALTH (NIT) SEE!
I'M TIRED OF HAVING THESE PERSCRIPTIONS TRIED ON ME
THIS CURES EVERYTHING
R. F. Outcault.

Drawn for the Pharmaceutical Era by R. F. Outcault (with permission of the N. Y. Journal.)

drawings attracted the attention of Thomas A. Edison, who, as the greatest genius of the age, is quick to recognize genius in another, and Mr. Edison at once sent him to Paris with an exhibition of electrical inventions. He remained in the French capital a year.

While still a resident of Cincinnati, Mr. Outcault used to frequent the homes of the poor in order to study for his own amusement life in those quarters. He got acquainted with the dwellers in the tenements, joined them in their amusements, and learned their entertaining traits of manner and pose. This was at his most impressible age, and though he did not then make use of his talents, every stroke of his pen was valuable practice for his after work of amusing the public.

Mr. Outcault's first art work for a newspaper was done in 1894. The story is that he drew the first yellow kid for the New York World, on which he was formerly employed, and that the sketch was declined. Upon securing employment with the Journal he tried it again, and made a hit. It is said that he is a little doubtful about the value of a yellow kid reputation. His ambition is to delineate in the highest style of art, pleasing and truthful types of child life, and he has done some meritorious work in that field. But the public will have yellow kids and lots of them. Edward W. Townsend and Rudolph Block, high-priced story tellers, are kept constantly at work describing the adventures of the yellow kid which Mr. Outcault has to illustrate for his newspaper. A yellow kid magazine has also been started. A yellow kid brand of cigarettes has been put upon the market, with a different yellow kid picture in every package. Every street has its enterprising window display embellished with yellow kids. Yellow kid puppets are sold by fakirs on the streets. The type founders are casting yellow kids in black and white for the use of advertisers. Flesh and blood cannot turn out yellow kids fast enough to supply the demand. Mr. Outcault, therefore, has little time to devote to other branches of art.

Success has not spoiled Mr. Outcault. He is the same genial, wholesouled, generous friend in prosperity that he was in the days when he first attracted the attention of Edison by the accuracy of his mechanical art. Now, as then, he finds his highest enjoyment beside his own hearth, and his most pleasing occupation is delineating the graces of his children.

TRAUMATOL.—An antiseptic compound of pure cresylic acid and iodine, which forms an amorphous, violet colored, voluminous, inodorous powder, which contains nearly 54.4 per cent. of iodine. Traumatol is insoluble in water and acids, soluble in chloroform, strong alcohol and carbon disulphide. The compound is stable when exposed to light and air.

EUNATROL is an oleate of sodium, which has been tested by Dr. Blum, of Frankfort, as a cholagogue. Eunatrol appears in the market in pill form, each pill containing 0.25 gm., coated with chocolate. Dr. Blum claims this to be the best of all cholagogues, as it can be taken for long periods without producing intestinal disturbances. Dose, one pill twice daily.

METHAETHYL.—A local anæsthetic which is intended as a substitute for ethyl chloride; it is an ethereal pleasant smelling fluid, which boils at 0° C. Methæthyl appears in the market sealed in glass tubes, inclosed in a metallic case; on breaking the capillary tip of the tube the vapor escapes and is directed upon the surface to be anæsthetized.

TO PREVENT THE HAIR FALLING OUT it has been recommended to rub the scalp well with the following ointment: Pilocarpin hydrochlorate, 1 p.; vaseline, 10 p.; lanolin, 30 p.; oil of lavender, 25 drops.

(*Special Correspondence.*)

WORKING UP TRADE IN INDIA.

PECULIARITIES OF NATIVE MERCHANTS. PLEASURES OF TRAVEL AND HOTEL ACCOMMODATIONS. WHAT AMERICAN MANUFACTURERS SHOULD DO.

Madras, India, Feb. 1, 1897.—During the past sixty days we have visited every section of India, from the snow-clad Himalayas of the north to the jungle and rice fields of the south; visited not only the large distributing centers, but also many of the interior towns, so as to see the exact position of the drug business, and what is necessary to cater successfully to it. In Calcutta we found several large European stores that carry good stocks and are up to date as retail concerns, but the nearest approach to a wholesale drug business is owned by a native. And in all of north and central India we saw signs of his work, showing us that a wholesale house conducted on the right lines by Europeans would be a success.

In Madras we find two concerns that are up to pushing their business, though in different ways. W. E. Smith & Co. have at an enormous expense erected one of the finest drug stores and laboratories we have ever seen. With its fantastic towers, domes and exterior decoration it resembles at a distance some public building. On the other hand, R. McClure, chemist, has a very quiet, unpretentious building, but his ideas of modern advertising are the best we have seen in connection with any drug business in India. Aside from these, we find several very good stores owned by natives. South India impressed us as being a very good district for the drug business, and the number of stores, small and large, to be found everywhere, gave this impression some weight.

In every town we visited, away from the principal distributing points, we found the drugs controlled exclusively by natives. As a rule, their stores are of a very poor class, and are known as medical halls or dispensaries. They do not appear to know how to display goods; everything appears unkempt and mussed together. There is no excuse for this, for the number of clerks or assistants to be found, even in stores of a very inferior class, is surprising. What they all do, besides getting in each other's way, we could not discover. There are always several proprietors, for they are great on companies. Then they have a manager, clerks galore and numerous coolies squatting all over the place. Their conception of advertising seems to be a small handbill, which is handed around in a slipshod manner. We were very much interested in seeing what line of patents they prepared, and found nearly everywhere that they were for nerve complaints, all tending toward the aphrodisiacal. The manner in which they describe diseases and remedies on what little advertising matter they do issue is startling; they call a spade by its right name. We were much amused by a signboard describing the wonderful power of a great rejuvenator, which, they claimed, was made by the light of a full moon. From the appearance of the bottle it looked as though it had been put up on a very dark night. It was in this class of stores that we were disappointed when looking over their line of fluid extracts, etc. Very few American brands were found. There is no reason why concerns like Wyeth & Bro., P., D. & Co., cannot have their portion of this trade if they work for it. It is these small stores, scattered all over India, that form the foundation for any large business. And to secure it requires personal solicitation, not once but many times. Our American houses are well represented in the larger towns, we admit; but, if they want business, they must do something besides sending literature to the outside towns. It is doubly important that their representatives visit these smaller places, for in every store you will find several native medical men, who are, as a rule, interested in the business. But when we looked over the patent medicines they handle we felt as though we were at home. Nearly all the line of standard remedies were there. The best sellers are Pain Killer, Ayer's goods and Scott's Emulsion, and some of Jayne's goods are seen. For intelligent representation, I think that Scott & Bowne take the lead. Their method of reaching the native population is good, for which they are indebted greatly to their resident agent, Mr. John Kirkbride, who not only knows India, but is acquainted with her people.

It is a pleasure to find that the glassware of W. T. & Co. is used pretty generally, and the success of this concern in pushing their products to the four corners of the world could well be copied by some of the rest of our large manufacturers. There is a good opportunity for some of our perfume men to catch on to a fine business out here, for India is a great consumer of that article. Not only a good trade could be secured in bulk goods, but a very large one on small packages is certain. And as a pointer we will state that the perfume must be of a pungent nature for the natives, and that the packages must be made up in a fantastic shape, with strong colors predominating. The beauty of this class of goods is that they would find buyers, not only in the drug store, but also the large European general store and the bazaars. In fact, the perfume department is a conspicuous one in all stores.

There are one or two lines of American perfumes here, but they are of a class that will not bear very close inspection. Manufacturers of good, cheap toilet soaps can also increase their business, if they are enterprising enough.

But do not for the moment think that by sending a traveler here one trip you can secure and control the business. It takes constant calling by the same traveler to instill confidence into the native reader's mind. And it is because of this fact that they buy, more than from any merits the house that makes the goods may possess. They know Mr. ———, who has been to see them year after year, have faith in what he says, and that is all they care for.

When traveling in the East there are two things positively necessary—one a servant, and the other a lot of bedding, for you will visit many places that do not furnish either. It nearly made us sick at first to see the lot of stuff we had to carry, and if a traveler should go about in the United States with such an assortment he would be considered a freak. Railroading here is only fair—the rate of speed slow, and accommodation, when compared with Pullman service, away off. Still, you can be comfortable if you carry your linen and blankets. The carriages are constructed so that there are sleeping berths for four in the first class, and the average rate is about two cents a mile; servants are carried at a much lower figure—not over ¼ cent per mile. The eating houses are tough; one can manage, however, to secure nourishment enough at one to carry him on to the next. It appears to be the custom when any one travels here to take all his belongings with him, and it is most unpleasant to be awakened during the night by some one getting into your compartment at some side station. It were not so bad, were it not for what they bring with them. Always a big roll of bedding, silk hat box (though we have never seen a high hat worn), tin trunks, valises, golf sticks, fishing tackle and guns, sometimes a saddle or two, and, if there are any ladies in the crowd, you may expect a lot more boxes, flower plants, bird cages and a grub box. We have seen the carriage so full at times of outfits of this description that it was nearly impossible to move. The checking of baggage has not been introduced into India. Every one likes to see his own property near him, and since every one has one or more servants to handle or look out after the stuff, I presume there never will be any reform.

When you come to the hotel question, that absorbing topic to all travelers, we are sorry to state that they are very poor, and will not compare favorably with a decent boarding house in America or Australia. Take, for example, what is considered the best hotel in Calcutta and one of the leading ones in India. The day we arrived it took some time to find the entrance, which was at a little side door. Up a dirty stairway we managed to find the office in the smallest room in the house, and our ascent was hastened by the odor of stale cheese and old meats that are sold on the first floor by the hotel company. But when we found the office there was not a European there; nothing but a lot of native clerks. During all the time we have been in India, and we have visited every section and have stopped in hotels that are owned by Europeans, with one exception all arrangements had to be made with native servants. There is always a Baboo in charge. The only conclusion is that they are either ashamed of their hotel, or consider the business degrading, for caste is nearly as strong here with Europeans as with natives. Their rates run from four rupees to ten rupees per day, and you are, indeed, a fortunate individual if when you pay your bill you do not find some extras. Portions of days are not known. 'Tis no difference whether you have one meal or three, if you occupy a room you pay for the entire day. After we had been out over a town and felt tired or blue we could always raise our spirits by reading some of the rules and regulations found in the bedroom. Though each guest is expected to have one or more personal servants, still there is always a mob around these hotels, for caste distinction is so great that the man who brings water into your bedroom will not carry away the slops, and the one that brushes up the floor could not, for the life of him, make the bed. Then, in the dining room, you always find a lot more whose business seems to be getting in each other's way.

But the sight of sights is at night time, in the hallways. In front of each door you see the private servant stretched out sleeping the sleep of the just, while near him is the punkah wallah hard at work pulling the rope that is attached to the huge punka fan hanging over the bed. And the attitudes he assumes at times are wonderful. Stretched out on the flat of his back, with the rope fastened to a toe, he lies there slowly pulling the fan till he thinks his master has gone to sleep, when he takes a quiet doze; but often he is mistaken and the inmates of adjoining rooms are disturbed by the frequent application of a foot to Mr. Punkah Wallah. But in all towns you do not find even such luxury as I have described. Then you have to put up at the travelers' dak bungalow. These excellent institutions are owned by the government and are to be found along all well-traveled routes, and in towns where there are no hotels. They furnish you a room, containing a bedstead, chair and table, and, in some instances, the keeper has a set of dishes. But you are expected to furnish your own bedding and to secure your food the best way possible. It is in cases like this that a good personal servant, speaking various vernaculars, is valuable, for he not only takes care of your room, but also rustles up something to eat. According to the rules of these bungalows, no one is expected to stay more than two days, and should any traveler come and demand accommodation you would have to give way to him. They are simply rest houses or travelers' inns. During the time we have been traveling in India, we have not met or heard of a single traveler representing a local house, and it was only in Bombay, Calcutta and Madras that we ran across any representative of English or German houses. In a very large upcountry town we were much amused at a European buyer who said that travelers were bothering him very much; during the past month three had called to see him.

Dock tells a good one that happened to him. He was urging a dealer to put in his goods, and the first excuse offered was that he was not sufficiently acquainted with the requirements of his trade to know just what would sell in his district. He was a newcomer, having only started in business in 1862.

W. A. P.

TARIFF SCHEDULE.

Last week the work of the Ways and Means Committee on the Dingley Tariff Bill was reported to the House for consideration and we present herewith the various proposed schedules and parts of schedules in which the retail drug trade is specially interested. With these schedules are the schedules now in force and those obtaining under the McKinley Tariff Act of 1890.

SCHEDULE A—CHEMICALS, OILS AND PAINTS.

	Dingley. Bill.	Present Law.	McKinley Law.
Acids, acetic, lb	3c.	20%	1½c.
Boracic, lb	3c.	3c.	5c.
Chromic, lb	4c.	4c.	6c.
Lactic, lb	4c.	—	—
Citric, lb	8c.	25%	10c.
Salicylic, lb	10c.	Free.	Free.
Sulphuric, lb	¼c.	Free.	¼c.
Tannic, or tannin, lb	50c.	60c.	75c.
Gallic, lb	10c.	Free.	Free.
Tartaric, lb	7c.	20%	10c.
All other acids	25%	Free.	—
Alcoholic perfumery and alcoholic compounds not otherwise provided for	60c.lb& 45%	$2gl& 50%	$2gl& 50%
Alkalies, alkaloids, distilled, essential, expressed and rendered oils and chemical compounds not otherwise provided for	25%	25%	25%
Alumina, hydrate of, lb	6-10c.	4-10c.	6-10c.
Alum, alum cake, etc., lb	½c.	4-10c.	6-10c.
Ammonia; carbonate of, lb	1¼c.	20%	1¾c.
Muriate of, lb	¾c.	10%	¾c.
Sulphate of, lb	½c.	20%	½c.
Argols, or crude tartar, lb	1½c.	Free.	Free.
Partly refined, lb	4c.	20%	4c.
Rochelle salts, lb	4c.	2c.	3c.
Cream of tartar and patent tartar, lb	6c.	20%	6c.
Blue vitriol, lb	1c.	Free.	2c.
Bone char suitable for decolorizing sugars	20%	20%	25%
Borax, crude, lb	2c.	2c.	3c.
Borate of lime, lb	2c.	1½c.	3c.
Borax, refined, lb	3c.	2c.	5c.
Camphor, refined, lb	4c.	10%	4c.
Chalk, ground, precipitated or prepared only in the form of cubes, blocks or disks, as tailors', billiard red, or French, lb.	1c.	20%	1c.
Chalk preparations, except medicinal or toilet, and all manufactures of chalk not otherwise provided for	25%	20%	20%
Chloroform, lb	20c.	25c.	25c.
Coal tar colors or dyes, not specially provided for	35%	25%	35%
Coal tar preparations, not colors or dyes, not specially provided for	25%	Free.	20%
Cobalt, oxide of, lb	25c.	25c.	30c.
Collodion, lb	50c.	40c.	50c.
Collodion, rolled in sheets, lb	50c.	50c.	60c.
Collodion, manufactured, lb	75c. &30%	45%	60c. &25%
Coloring for brandy, etc.	50%	50%	50%
Copperas, lb	¼c.	Free.	3-10c.
Drugs, such as barks, etc., advanced in value by any process of manufacture, and not specially provided for	10%	10%	10%
Ethers, sulphuric, lb	25c.	40c.	40c.
Spirits of nitrous, lb	25c.	25c.	25c.
Fruit ethers, oils or essences, lb	$2	$2	$2.50
Ether not otherwise provided for, no ether shall pay less than 25%, lb	$1	$1	$1
Logwood, extracts and decoctions not otherwise provided for, lb	⅞c.	10%	⅞c.
All above in solid or dry form, lb	1½c.	10%	⅞c.
Hemlock bark extracts, lb	½c.	10%	½c.
Gelatine glue, etc., value not above 10c. a pound, lb	2c.	25%	1½c.
Above 10c. and not above 25c., lb	3c. &15%	— 25%	— 25%
Above 25c. and not above 40c., lb	5c.&15%	25%	25to30%
Above 40c., lb	20c. &15%	25%	30%
Glycerine, crude, lb	1c.	1c.	1¾c.
Glycerine, refined, lb	3c.	3c.	4½c.
Indigo extracts or paste, lb	¾c.	Free.	¾c.
Indigo, carmine, lb	10c.	Free.	10c.
Ink, not otherwise provided for	25%	25%	30%
Iodine, resublimed, lb	20c.	Free.	30c.
Iodoform, lb	$1	$1	$1.50
Licorice, lb	5c.	5c.	5½c.
Chicle, lb	10c.	Free.	Free.
Magnesia, med. carbonate, lb	3c.	3c.	4c.
Magnesia, calcined, lb	7c.	7c.	8c.
Magnesia, sulphate, or Epsom salts, lb	1-5c.	1-5c.	3-10c
Alizarine assistant, containing 50% or more castor oil, gl	40c.	30%	80c.
Containing less than 50% castor oil, gal	20c.	30%	40c.
All other alizarine asst.	30%	30%	30%
Castor oil, gal	35c.	35c.	80c.
Cod liver oil, gal	15c.	20%	15c.
Cottonseed oil, gal	7c.	Free.	10c.
Croton oil, lb	20c.	Free.	30c.
Flaxseed and linseed oil, raw, boiled or oxidized, gal	32c.	20c.	32c.
Poppy seed oil, raw, boiled or oxidized, gal	10c.	20c.	—
Fusel oil, lb	½c.	10%	10%
Hempseed and rapeseed oil, gal	10c.	10c.	10c.
Olive oil, gal	50c.	35c.	35c.
Peppermint oil, lb	65c.	25%	80c.
Seal, herring and other fish oil, gal	8c.	25%	8c.
Opium, crude, lb	$1	Free.	Free.
Morphia or morphine, and all salts of opium, oz.	$1	50c.	50c.
Aqueous extract of opium, tincture of opium and other liquid preparations not otherwise provided for	40%	20%	40%
Opium containing less than 9% of morphia and opium prepared for smoking, lb	$6	$6	$12
Baryta, unmanft'd, ton	75c.	Free	$1.12
Manufactured, ton	$5.25	$3	$6.72
Blues, such as Berlin, etc., containing ferrocyanide of iron, dry or ground in or mixed with oil, lb	8c.	6c.	6c.
In pulp or mixed with water, lb	8c.	6c.	6c.
Blanc, fixe, or sulphate of barytes and satin white, lb	½c.	25%	¾c.
Black, made from bone, ivory or vegetable, including bone black and lamp black, dry or ground in water	25%	20%	25%
Chrome yellow, etc., dry or ground in or mixed with oil, lb	4½c.	3c.	4½c.
In pulp, or mixed with water, lb	4½c.	3c.	4½c.
Ochre and ochre earths, sienna and sienna earths, umber and umber earths not otherwise provided for, dry, lb	¼c.	Free.	¼c.
Ground in oil, lb	1½c.	1¼c.	1½c.
Orange mineral, lb	3c.	1¾c.	3½c.
Red lead, lb	2½c.	1½c.	3c.
Ultramarine blue, lb	4c.	3c.	4½c.
Wash blue containing ultramarine, lb	4c.	3c.	3c.
Varnishes, except spirit varnishes	35%	25%	35%
Spirit varnishes, additional for the alcohol contained, gal	$1.32	$1.32	$1.32
Vermilion red and other colors containing quicksilver, lb	12c.	20%	12c.
Not containing quicksilver, lb	6c.	6c.@25%	
White lead, white paint and white pigment, containing lead, lb	2½c.	1½c.	3c.
Whiting and paris white, dry, lb	¼c.	¼c.	½c.
Ground in oil or putty, lb	1c.	½c.	1c.
Zinc, oxide of, and white paint or pigment containing zinc, but not lead, dry, lb	1c.	1c.	1¼c.
Ground in oil, lb	1¾c.	1c.	1¾c.
Sulphide of zinc, white, lb	1¼c.	25%	25%
Chloride of zinc and sulphate of zinc, lb	1c.	25%	25%
All paints, colors and pigments not otherwise provided for	30%	25%	25@30%
Acetate of lead, white, lb	3½c.	2¾c.	5½c.
In colors, lb	2½c.	1¾c.	3½c.
Nitrate of lead, lb	2½c.	1½c.	3c.
Litharge, lb	2¾c.	1½c.	3c.
Phosphorus, lb	20c.	15c.	20c.
Bichromate and chromate of potash, lb	3c.	25%	3c.
Caustic or hydrate of potash, lb	1c.	Free.	1c.
Chlorate of potash, lb	3c.	Free.	—
Hydriodate and iodate of potash, lb	25c.	25%	50c.
Nitrate of potash, refined, lb	½c.	½c.	1c.
Red prussiate of potash, lb	8c.	25%	10c.
Yellow prussiate of potash, lb	4c.	25%	5c.
Cyanide of potash, lb	6c.	25%	25%
Medicinal preparations containing alcohol, not otherwise provided for, lb In no case shall above pay less than 25%.	55c.	50c.	50c.
Medicinal preparations not containing alcohol, not specially provided for	25%	25%	25%
Calomel and other mercurial medicinal preparations	35%	25%	35%
Phenacetine not specially provided for, oz	8c.	25%	25%
Phenacetine in small powders, including weight of wrappers, oz	10c.	25%	25%
Antipyrine, oz	18c.	25%	25%
Anti-toxine of 100 units or less of anti toxic strength oz	12c.	25%	25%
Each additional 100 units or fractional part thereof, oz	12c.	25%	25%
Plasters, healing or curative of all kinds	35%	25%	25%
Cosmetics, etc., and other toilet articles and perfumeries not otherwise provided for	50%	40%	50%
Santonine and salts thereof, containing 80% or over of santonine, lb	$1	$1	$2.50
Castile soap, lb	1¼c.	20%	1¼c.
Fancy perfumes, toilet or medicinal soap, lb	15c.	35%	15c.
Soaps not specially provided for	20%	10%	20%
Bicarbonate of soda, or supercarbonate or soda, or saleratus and other alkalies containing 50% or more bicarbonate of soda, lb	¾c.	½c.	1c.
Bichromate and chromate of soda, lb	2c.	25%	3c.
Crystal carbonate of soda, lb	½c.	⅛c.	¼c.
Caustic soda, lb	½c.	½c.	1c.
Nitrite of soda, lb	2½c.	25%	25%
Hypo-sulphite and sulphide of soda, lb	½c.	25%	25%
Salsoda or soda crystals, lb	¼c.	⅛c.	¼c.
Soda ash, lb	¼c.	¼c.	¼c.
Silicate of soda or other alkaline silicate, lb	⅜c.	⅜c.	½c.
Sulphate of soda, or salt cake, or nitre cake, ton	$1.25	Free.	$1.25
Paris green and London purple	25%	12½%	25%
Sponges, crude	20%	10%	20%
Manuf're of sponges not specially provided for.	40%	35%	20%
Strychnia and all salts thereof, oz	30c.	30c.	40c.
Sulphur, refined, ton	$8	20%	$8
Sublimed, or flowers of, ton	$8	20%	$10
Vanillin, oz	70c.	25%	25%

MISCELLANEOUS.

	Dingley Bill.	Present Law.	McKinley Law.
Lime, including weight of barrel or package, cwt.	5c.	5c.	6c.
Plaster of paris or gypsum, ground or calcined, ton	$1.50	$1@1.25	$1@1.75
Pumice stone, wholly or partially manufac'td, lb	½c.	20%	Free.
Unmanufactured	20%	Free.	Free.
China clay or kaolin, ton.	$2	$2	$3
Asphaltum and bitumen, not otherwise specially provided for, ton	$3	Free.	Free.
Tapioca and sago in flake, pearl or flour, lb	½c.	Free.	Free.
Arrow root flour, lb	3c.	1½c.	2c.
Sugar of milk, lb	5c.	5c.	8c.
Honey, gal	20c.	10c.	20c.
Hops, lb	15c.	8c.	15c.
Garlic, lb	1c.	10%	10%
Castor beans or seeds, bu	25c.	25c.	50c.
Flaxseed or linseed and other oil seeds not specially provided for, bush	30c.	20c.	30c.
Seeds of all kinds not specially provided for	40%	10%	30c.
Oranges, lemons, limes, grape fruit, shaddocks or pomelos, lb	¾c.	8c.cu.ft.	—
In addition thereto upon the boxes, barrels or other articles containing the foregoing	30%	$1.50 30%	13c. &$1.50 30%
Orange peel and lemon peel, preserved or candied, lb	2c.	30%	2c.
Citron or citron peel, preserved or candied, lb	2c.	30%	35%
Pineapples, lb	2c.	20%	Free.
Almonds, not shelled, lb	5c.	3c.	5c.
Clear shell, lb	7c.	5c.	7½c.
Filberts and walnuts of all kinds, lb	3c.	2c.	3c.
Filberts and walnuts, shelled, lb	6c.	4c.	6c.
Peanuts or ground beans, shelled, lb	1c.	20%	1c.

	Dingley Bill.	Present Law.	McKinley Law.
Nuts, shelled or unshelled not specially provided for lb	1½c.	20%	½c.
Extract of meat, not specially provided for, lb..	35c.	15%	35c.
Fluid extract of meat, lb.	15c.	15%	15c.
Lard, lb	2c.	1c.	2c.
Tallow, lb	1c.	Free.	1c.
Chicory root, unground, lb	1c.	Free.	Free.
Chicory root, burnt or roasted, ground or otherwise prepared, lb	3c.	2c.	2c.
Cocoa butter or cocoa butterine, lb	6c.	3½c.	3½c.
Dandelion root and prepared acorns, and other articles used as coffee, lb	1½c.	1½c.	1½c.
Starch, including all preparations fit for use as starch, lb	2c.	1½c.	2c.
Dextrine, burnt starch, gum substitute or British gum, lb	1½c.	1½c.	1½c.
Mustard, ground or prepared, lb	10c.	25%	10c.
Capsicum or red pepper, or cayenne pepper, lb	2½c.	2½c.	2½c.
Sage, lb	1c.	1c.	3c.
Sweet marjoram, lb	3c.	Free.	Free.
Summer savory, coriander seed and thyme, lb	½c.	Free.	Free.
Spices not specially provided for, lb	3c.	3c.	4c.
Vinegar, gal	7½c.	7½c.	7½c.
Spirits—Brandy and other spirits, manufactured or distilled from grain or other materials, and not specially provided for, per proof gallon	$2.50	$1.80	$2.50
Bay rum or baywater, whether distilled or compounded, of first proof, and in proportion for any greater strength than first proof	$1.50	$1	$1.50
Malt extract, fluid in cks, gals	25c.	15c.	20c.
Malt extract, bottles or jugs, gal	40c.	30c.	40c.
Malt extract, solid	40%	30%	40%
Ginger ale, ginger beer, lemonade, soda water and other similar waters, in plain, green or colored, molded or pressed glass bottles, containing each not more than ¾ of a pint, per doz	18c.	20%	13c.
Containing more than ¾ of a pint each and not more than 1½ pints, per doz	28c.	20%	26c.
Mineral waters and imitations of natural mineral waters, and artificial mineral waters not specially provided for, in green or colored glass bottles, containing not more than one pint, per dozen	30c.	20%	16c.
If containing more than one pint and not more than one quart, per doz	40c.	20%	25c.
If imported otherwise than in plain, green or colored glass bottles, or if imported in such bottles containing more than one quart, per gal	30c.	20%	20c.
Cork, cut into squares or cubes, lb	8c.	10c.	10c.
Manufactured cork, over ½ inch in diameter, measured at larger end, lb.	15c.	10c.	15c.
One-half inch and less in diameter, lb	25c.	10c.	15c.

THE FREE LIST.

ACIDS.—Arsenous, fluoric, muriatic, nitric, phosphoric, picric or nitro-picric, prussic, silicic, sulphuric, for agricultural purposes.

DRUGS AND CHEMICALS.—Aconite, albumen, alizarin, natural and artificial; alizarin dyes, anthracin dyes, ambergris, aniline salts, annatto, annatto extracts, arrowroot, crude; arsenic, arsenic, sulphide of; aniline, arsenate of, and other crude dyes not provided for.

Asafoetida, balm of gilead, cinchona or other quinine barks, bismuth.

Fish sounds, crude or salted; camphor, crude; castoreum, cerium, civit, crude; cocoa, crude; cocoa, fibre, leaves and shells; cuttlefish bone, dandelion roots, unground; dragon's blood.

Drugs, such as barks, beans, berries, balsams, buds, bulbs and bulbous roots; excrescences, such as nutgalls, fruits, flowers, dried fibres and dried insects; grains, gums, and gum resin, herbs, leaves, lichens, mosses, nuts, roots and stems, spices, vegetables, seeds aromatic and seeds of morbid growth not provided for.

Ergot, iodine crude, ipecac, iridium, jalap.

Leeches, licorice root, unground; lime, citrate of; bleaching powder.

Magnesia, carbonate of; manna, althea root, leaves or flowers; moss and sea weeds, crude; musk, crude; nux vomica.

OILS.—Amber, ambergris, aniseed, aniline, cajeput, caraway, cedrat, chamomile, civet, cocoanut, fennel, jasmine or jasimine, juglandium, juniper, mace, neroli, or orange flower, nut oil or oil of nuts not specially provided for in this act, olive oil or olive oil foots imported expressly for manufacturing or mechanical purposes, and fit only for such use; palm, thyme, origanum, red or white; valerian; and also spermaceti, whale and other fish oils of American fisheries, and all other articles, the products of such fisheries; petroleum, crude or refined.

Black salts, saltpetre, crude; sulphate of potash, muriate of potash.

Quinine and all salts of cinchona bark, saffron and safflower, saffron cake, salacin.

SEEDS.—Anise, caraway, cardamom, cotton, cummin, fennel, foenugreek, hemp, hoarhound, mustard, rape, St. John's bread, sugar beet, mangel wurzel, sorghum or sugar cane for seed.

Salep, soda, nitrate of; and chlorate of; sodium, strontia and preparations, sulphur or brimstone, crude in bulk, sulphur precipitated; pyrites (excess of 25 per cent. sulphur).

Tonka beans, turmeric, turpentine, Venice; turpentine, spirits of; vaccine virus, verdigris.

FRUITS, &c.—Cocoa, crude; coffee, curry and curry powder; fruits, green, ripe or dried not provided for.

Brazil nuts, cream nuts, palm nuts, palm nut kernels, cocoanuts, cocoanut meat or copra, sago, crude, tamarinds, tea and tea plants, yams.

SPICES.—Cassia, cassia vera, and cassia buds; cinnamon, and chips of; cloves and clove stems, mace, nutmegs, pepper, black or white, and pimento; all the foregoing when unground; ginger root, unground, and not preserved or candied.

MISCELLANEOUS.—Antimony ore, antimony, crude, sulphite of; apatite, asbestos, crude; ashes, wood; lye from wood ashes, ashes, beet root; asphaltum, and bitumen, crude.

Barytes or carbonate of; bauxite, crude; beeswax, binding twine (600 feet to pound), blood, dried; bones, in crude state; bone dust and bone ash; Brazil paste, bristles, crude; Burgundy pitch.

Cadmium, calamine, chalk, crude; chromate of iron, or chromic ore; coal tar and pitch; creosote oil, cobalt and cobalt ore.

Cocculus indicus, cochineal, gold, silver and copper coins; copper, ore; copper composition; copper, regulus; copper, cement; copper, black or coarse; corkwood or bark, cryolite, cudbear, cutch, divi divi.

Casks, barrels, carboys, bags and other vessels of American manufacture exported filled with American products or exported empty and returned filled with foreign products, including shooks when returned as barrels or boxes; also quicksilver flasks or bottles, of either domestic or foreign manufacture, which shall have been actually exported from the United States.

Emery ore, feldspar, fish skins, flint and flint stones, fossils, gambier, grasses and fibres, istle or Tampico fibre, jute and jute butts, manilla, and sisal grass; grease and oils for soapmaking not provided for.

Guano and the other manures, gutta-percha, crude; India rubber, crude; hair, hides, goat skins, raw; hide cuttings and other glue stock; hoofs, horns and horn strips, hop roots.

Indigo, ivory tusks, vegetable, ivory, kelp, kieserite, kainit, lac dye, crude; lac spirits, lactarene, lava, crude; litmus.

Madder, madder extracts, magnesite, magnesium, manganese, oxide and ore of; marrow, crude; minerals, crude; myrobolam, oil cake.

Orchil and liquid, osmium, palladium, paper stock, crude; phosphates, crude; gypsum or terra alba, crude; platina and platinum, plumbago, rennet.

Rotten stone, cliff stone, tripoli and sand, n. e. s.; storax, wood tar and pitch, terra japonica, tin ore, bars, pigs or granulated; black oxide of tin, tobacco stems, uranium, oxide of; valonia, wax, vegetable or mineral, whalebone.

CERIUM NITRATE, when in solution (1 : 1000), effectually prevents all further growth of bacteria.

HYDRARGYROSEPTOL.—A compound of chinosol-mercury with sodium chloride, recommended as an antiluetic.

SOZOBORAL.—A mixture of aristol, sozoiodol and boric acid salts intended to be used as a snuff in treatment of colds.

LEMON JUICE (Artificial).—Sugar 100 gm., distilled water 50 gm., citric acid 7.5 gm., tincture of fresh lemon peel (1 : 5) 5 to 8 gm., orange flower water 15 to 20 gm.

ARSENICAL HAEMOL.—We have thus far iodo-bromo-copper-iodo-mercuric, and zinc hæmol. This new preparation, a brown powder, contains 1 part of arsenous acid in each 100 parts.

ARGENTOL ($C_6H_6N.\ OH.\ Aq.$)—A compound of silver and oxychinolin, to be used as an antiseptic.

OPAL.—A proprietary remedy for removing all sorts of blemishes. It consists of 94.98 per cent. water, 3.1 per cent. of acetic ether, 1.48 per cent. of extract of soap bark, with traces of acetic acid and acetate of lead.

ACETONE COLLODION.—Gaucher (Phar. Ztg.) proposes this as a vehicle in treatment of cutaneous affections. A mixture of 2 p. of acetone collodion with 1 p. of oil of cade has shown itself to be very useful in psoriasis.

—The Cleveland Pharmaceutical Association has elected these officers for 1897: President, N. Rosewater; vice-presidents, C. W. Benfield and W. M. Fox; secretary, H. M. Schlitt; treasurer, G. W. Voss.

Examination Questions of the
OREGON STATE BOARD OF PHARMACY.

CHEMISTRY. - Junior.

1. Give the symbols of the following elements: Sulphur, Ammonium, Iodine, Aluminum, Phosphorus, Zinc, Sodium, Arsenic, Potassium, Antimony, Copper, Calcium.
2. State the prominent characteristics of Carbon, and how does it compare with Oxygen as a supporter of combustion.
3. What are the properties of Hydrogen, and state the difference between Sulphurous and Sulphuric Acids?
4. Mention the different forms of Sulphur in use, and give the processes of obtaining sublimed Sulphur.
5. What is Sublimation, and mention as many substances as you can, obtained from this process.
6. How would you take the specific gravity of a liquid heavier than water?
7. What is the source of Phenol? How much is needed to make 12 ounces of a 5 per cent. solution?
8. What is White Precipitate, White Vitriol, Litharge, Sugar of Lead?
9. Write out in equations, the action of Sulphuric Acid on Calcium Carbonate.
10. Describe the process of Precipitation, and mention two substances obtained by this process.

CHEMISTRY.—Senior.

1. Name ten elements, and state whether solid, gaseous, or liquid. Also describe an atom, molecule, chemical compound, monad, dyad.
2. What is Specific Gravity? Describe fully how you would take the Specific Gravity of a solid. Of a liquid.
3. Give chemical name, and uses of the following: Salts of Tartar, Cream of Tartar, Glauber Salts, Red Precipitate, Chlorate of Potash.
4. How would you detect very finely powdered Bichloride from the Mild Chloride of Mercury? Give doses of each.
5. What is the source of Iodoform? What per cent. of Cyanogen does the dilute Hydrocyanic Acid contain? Give its source, also dose.
6. How is Crystallized Nitrate of Silver obtained? How does it differ from Lunar Caustic, and give its antidote?
7. Name two preparations obtained from each of the following: Phosphorus, Sodium, Iodine, Quicksilver, Boron, with source of each.
8. Describe the action of Ammonia on fats. How is Ammonia obtained? Give per cent. by weight of Ammonia gas in Aqua Ammoniæ Fortior, and in Aqua Ammoniæ, U. S. P.
9. Give the process of Crystallization in detail, and describe the crystals of Permanganate of Potash, also Chloral Hydrate.
10. Give the chemical composition of Hydrochloric Acid, Phosphoric and Sulphurous Acids, Ammonia, Saltpetre.

PHARMACY.—Senior.

1. Define solution. Give example of simple and chemical solution. Name the solvents in the order of their usefulness.
2. What is the active principle of Belladonna? Hyoscyamus? Are they alkaloidal or otherwise? What the dose of the Fl. Ext. of each? In what respect do the two drugs differ, and in what are they similar in their physiological effects?
3. How much Morphine is represented in one oz. powdered Opium, official strength? In one oz. Dover's Powder? Write ℞ for Dover's Powder, in which each powder shall represent ⅙ grain Morphine.
4. Give the Continental rule for preparing an emulsion; detail the steps in order; what per cent. of medicinal substance will it contain?
5. Give formula for tincture fresh herbs. Its Latin name. Of what strength are the official tinctures? How many official tinctures are there?
6. Give the component parts of compound Cathartic Pills. Pill of Aloes, Pill of Aloes and Iron, their official names, excipient used in each.
7. What is Specific Gravity? Specific Volume? Wherein do they differ? Give rule for obtaining each. From the rule find the Specific Volume of Glycerine. Alcohol.
8. What is the relative strength of a Fl. Ext. to the crude drug? What process is employed, U. S. P., for Fl. Ext.? Describe it.
9. Four samples contain, respectively, 10, 12, 16, and 20 per cent. of active principle. How much of each must be taken to produce a sample of 15 per cent? How much each of Glycerine and Alcohol must be taken to make Specific Gravity 1,000?
10. What are Liniments? How many are official? Give the formula for Carron Oil, and its official Latin and English names.

PHARMACY.—Junior.

1. How many grains in 4 oz. water. In f. ℥ iv?
2. Of what use is Alligation in pharmacy? Give example of its use?
3. State the difference between Excipient and Vehicle. Emulsification and Saponification. Desiccation and Exsiccation.
4. What is the basis of the Metric system of weights and measures? Write one Gramme. One Centigramme. One Decigramme. One Milligramme.
5. What is the percentage strength of Aqua Ammoniæ? Of Stronger Water of Ammonia? In what proportion must water be mixed with the latter to produce the former?
6. What is the source of Oil of bitter Almonds? Expressed Oil of Almonds? Are they fixed or Volatile? Of what use are they in pharmacy?
7. Give Latin names and doses of Chloride of Ammonia, Tannic Acid, Carbolic Acid, Fl. Ext. Digitalis, Fl. Ext. Aconite. To what class of remedies do they belong?
8. From what is Carbolic Acid obtained? What is its official synonym? How many parts of water dissolve it? How many parts liquefiy it?
9. What are the component parts of Solution of Lead Subacetate? Its Latin name? How is Lead Water prepared? Its official English and Latin names.
10. Write formula for Spirit of Mindererus. Latin and English names. How is Lime Water prepared?

TOXICOLOGY.—Junior.

1. Define Toxicology.
2. Name four official remedies which are Toxic, and four which are non-toxic.
3. Name three preparations of Arsenic. Give treatment for arsenical poisoning, with formula and dose of official antidote.
4. Give symptoms of Lead poisoning, and antidote.
5. Carbolic Acid. Describe effects of an overdose. Give three antidotes, describing the particular action of each.
6. Quinine, Aconite, Gelsemium, Ipecac, Arnica, Valerian. and Squills; name those which are Toxic.
7. Give antidotes and treatment for Opium poisoning.
8. What is the first duty of a Pharmacist when a case of suspected poisoning is brought in?
9. Name three common poisons, other than those named above, and give symptoms of overdose, with antidote for each.
10. Give a synopsis of the poison clause of the Oregon Pharmacy Law.

TOXICOLOGY.—Senior.

1. What does Toxicology teach? What is meant by drug antagonists? Chemical antidotes? Physiological antidotes?
2. Give antidotes for the Mercurial Salts, Chloride of Gold, Sulphate of Copper, and state whether they are antagonistic, chemical, or physiological antidotes.
3. Give treatment for Ammonia gas inhaled, also for overdose of solution internally.
4. Give symptoms and antidotes for poisoning by Tartar Emetic, Phosphorus, Iodine.
5. Generally, what are the antidotes for the Mineral Acids? Vegetable Acids? Give action of each.
6. Give effects of overdoses and antidotes, for the following: Aconite, Gelsemium, Convallaria, Digitalis, Belladonna.
7. Describe the effects of Chloral, its antagonists and chemical antidote.
8. Give treatment for poisoning by opium, or its Alkaloids. Strychnine.
9. Give effects and treatment for poisonous doses of Paris Green. London Purple.
10. Criticise the following prescriptions:

℞	Potassium Chlorate.	ʒ ii
	Quinine Sulph.	ʒ s s.
	Syrup. Ferri Iod.	℥ i
	Aquæ Fœniculæ	℥ ii
M	Sig. Teaspoonful.	
	Medicus, M.D.	

℞	Antipyrine	ʒ i
	Quinine Sulph.	ʒ s.s.
	Morphine Sulph.	grs.iii
	Zinc Valerianate.	grs. x
	Fl. Ext. Gelsemium.	gtts.
M	ft. Capsule No. xii.	
Sig.	1 capsule every 3 hours.	
	J. W. S., M.D.	

MATERIA MEDICA.—Junior.

1. Define Pharmacopœia, Materia Medica, and Dispensatory.
2. Give official names and doses of Strychnine, Elaterium, Red Iodide of Mercury, Phosphorus, and Sugar of Lead.
3. What is Asafœtida? How obtained, and medicinal effects.
4. Define Antipyretic, Febrifuge, Alterative, Stomachic. Expectorant.
5. Name five official Elixirs aad Syrups.
6. What is a Styptic? Name five agents acting as such.
7. Give official names of two insects used in medicine.
8. Give origin and doses of Santonin, Codeine, Caffeine, Atropine, and Pilocarpine.
9. Common names of Cydonium. Pepo. Terebinthina. Humulus Lupulus, Ulmus Contusa.
10. What precautions should a clerk use to preserve roots and herbs?

MATERIA MEDICA.—Senior.

1. Define Analgesic, Antizymotic, Calefacient, Convulsant, Antilithic. Aperient, Hemostatic, Vesicant, Anthelmintic, and Soporific, and give one drug applicable to each term.
2. Digitalis. Habitat, parts used, medical properties and official preparations, with doses.
3. Name five Emmenagogues, in order of value, with their doses.
4. Give official names, doses, and medical effects of Gentain, Pinkroot, Phosphide Zinc, Phosphorus. Quevenne's Iron, Dogbutton, Dilute Prussic Acid, Monkshood, White Oak Bark, and Lady's Slipper.
5. What is Manna? How obtained, medical properties, and what dangers attend its administration? Why?
6. Name ten diuretics, and doses.
7. What poisonous drug is found in Bismuth Subnit., impure, and what would be antidote?
8. Name five Antipyretics derived from coal tar, with doses, and dangers attending their use.
9. Give source, use, and dose of Amyl Nitrite.
10. Give official name for Poison Oak, Habitat and Therapy.

OXYGENIZED WATER.—A water saturated with 12 to 15 volumes of oxygen. recommended by Petit in uterine hæmmorrhages.

BROOKE'S PASTE consists of 28 p. of a 5 per cent. oleate of mercury, 14 p. of vaseline. 7 p. each of zinc oxide and starch, 1 p. of ichthyol and 1.2 p. of salicylic acid.

Electric Power in Country Pharmacies.

Two of the brightest pharmacists in the South are doing business in a couple of neighboring Mississippi towns, and but for W. W. Curtis, a traveling salesman for Sharp & Dohme, who reported the facts to an Era representative, their fame might never have gone outside the country where they reside.

P. B. King does business in Hazelhurst (population 1,800), and H. C. Price has a store in Wesson (population 3,200). Both towns derive their chief income from cotton mills, and the druggists, who were formerly partners and are still friendly to each other, have simply utilized the exhaust steam from these establishments to provide their stores with all the conveniences obtainable in the largest city. A portion of the steam is carried in pipes through a hot water tank back of the prescription counter. Another pipe conveys steam to the hot soda fountain, where a full line of hot and cold beverages are dispensed all the year round. But the most marvelous exhibitions of ingenuity are to be found in the electrical machinery rigged up in the back room of each store to relieve the druggists from back-breaking labor. This machinery is kept in motion by little dynamos run by the same exhaust steam. Ice cream for the soda fountain and triturations for the prescription counter are all manufactured by ingenious machinery in the back room. The same dynamos furnish brilliant electric lights for the stores, which are said to be the most luminous establishments in their respective neighborhoods in the evening. Both druggists are of an inventive turn, and interested in electricity, and it would be hard to tell which is entitled to credit for the brilliant idea of utilizing the exhaust steam of the cotton mills, which being a waste product may be had at practically the purchaser's own price.

A Drug Store of Old New York.

There is a deal of complaint nowadays about the narrow streets of lower New York, but old business men say they used to be much narrower. William street, for example, has been widened throughout, and that little tunnel called North William street, that dives under the Brooklyn Bridge to connect William street with Park Row, was cut through a block of houses that stood there many years ago. Park Row itself has been widened. It used to be the famous Chatham street, lined with the retail stores of old New York, being a favorite route to the principal business section for the fashionable residents of Henry and Madison streets, and connecting lower Broadway with what some then called its new rival, the Bowery. Chatham street was only twenty feet wide. The houses along the west side of it were all cut down to broaden it some forty years ago. Chambers street used to end at Chatham street, and its continuation eastward was secured by the city at great expense by purchasing and tearing down the buildings that stood in the way. Duane street also stopped at City Hall Park, and was cut through to join Chambers at Chatham in the same way.

This explanatory preface is deemed necessary to a proper understanding of the primitive conditions that prevailed where a historic old drug store used to stand. The address was at 3 Chambers, just off Chatham street. Old prints of the locality show a group of comfortable Dutch houses, with sloping roofs and dormer windows. Eight persons and two teams are to be seen on the street, in a locality where now the voices of the crowd and the rattle of trucks are drowned by the roar of passing elevated railroad trains. The placid scene represented in this picture, which was taken sixty years ago, has been caught in the rising tide of commerce, which has swept away almost the very landmarks. It is difficult to locate the site of the building now, but the records show that the new stone structure of the East River Savings Institution was erected on the same lot. The next house to it, No. 1 Chambers street, then occupied by a tool store, was partly torn down to widen Chatham street, as was also the old Commercial Bank Building, on the corner.

The old drug store was occupied during many years by Dr. R. B. Folger, a man famous in his day. His picture appeared in the January 7. Era, and shows him as he was in his old age. The site is also noteworthy from the fact that it was originally occupied by H. Planten for the manufacture of Planten's Capsules. The firm has since become H. Planten & Son, and the address is 224 William street. H. Rolff Planten of this firm well remembers the old drug store and its proprietor.

"He was a doctor of the old school," said Mr. Planten. "He used to put up a proprietary medicine, and he distributed his goods by wagon, leaving them to be sold on commission. He was of a generous and social disposition. At the time of his decease he was the oldest Mason in the United States who had taken the thirty-third degree. I do not know whom he succeeded in business, but the site had been occupied as a drug store from time immemorial when I was a boy."

The Use of Ad. Writers.

Talking with a well known advertiser the other day I happened to speak of the rapidly increasing army of ad-writers.

"Great people, sir," said my companion, "great people."

"You think they are really a help to advertisers?" I asked.

"Think, sir, think! I know it. Take my own case, for example—"

"Oh!" I interposed, "I didn't know you had ever employed an expert; I thought you wrote your own ads."

"So I do—every one of 'em."

"But—" I began helplessly.

"Let me tell you—" my companion interposed. "It's this way. You see, I never gave much attention to the kind of ad I put out until I began to read the talky-talk these experts print about themselves. They were all so cock-sure they could do me good that one day I sat down and wrote to one of the best known of them telling him to get up half a dozen ads at his advertised price. He replied by asking me to write him fully about my business, saying just how my goods differed from those of my competitors, in what particulars they were superior. etc. He said it was necessary he should have this information in order to prepare the ads.

"That seemed reasonable, so I sat down with my stenographer and spent the better part of an afternoon in putting on paper all the good things I could think of about my business. I went into the subject fully, talking to the stenographer just as though he was a prospective customer.

"Next morning when I read the typewritten copy of my dictation I tell you I was surprised. Wh; I hadn't the slightest idea I could write such good stuff. I suppose the knowledge that I was writing to one man—not to the great public—had influenced my style and enabled me to write in a chatty, yet convincing way.

"To make a long story short, I concluded that as I had what I wanted there wasn't any use in employing an ad-writer, so I let the expert slide and used my own stuff. Now when I want to write an ad I call my stenographer and dictate a letter something like this:

" 'Dear Mr. Ad Smythe: I wish you would prepare an ad for me announcing special sale of so and so. The points to emphasize are these:'

"Then I give him the facts in the case, and when the stenographer returns the typewritten letter to me I tear off the preamble and use the facts for my ad.

"Do I think ad-writers are a help to advertisers? Well. rather."—(Art in Advertising.)

QUESTION BOX

The object of this department is to furnish our subscribers with reliable and tried formulas and to discuss questions relating to practical pharmacy, prescription work, dispensing difficulties, etc. Requests for information are not acknowledged by mail and ANONYMOUS COMMUNICATIONS RECEIVE NO ATTENTION.

Stains for Glass.

(J. K.) see formulas for coloring lamp globes, glass, etc., this journal, Oct. 15, 1896, page 501.

States Having Medical Laws.

(G. D. S.) See "Legal Requirements for the Practice of Medicine," this journal, Dec. 24, 1896, page 825.

Cloudy Compound Syrup of Hypophosphites.

(C. E. T.) See formula No. 378, revised edition of the National Formulary. Two other formulas are given in the March 4 issue of this journal, page 274.

Canadian Pharmaceutical Journals.

(F. R. D.) The addresses of the Canadian pharmaceutical journals are: Canadian Druggist, 15 Toronto street, Toronto; Canadian Pharmaceutical Journal, 287 King street West, Toronto; Montreal Pharmaceutical Journal, Montreal.

Insolubility of Salicylic Acid.

(E. J.) To the prescription (this journal, March 11, 1897, page 302):

Morphine sulphate	8 grains
Salicylic acid	4 grains
Distilled water	1 ounce

W. S. Allen, Reidsville, N. C., suggests you "add about 7 or 8 grains of sodium bicarbonate to convert the salicylic acid into a soluble salt. A clear solution may thus be made."

Compound Extract of Vanillin and Coumarin.

(M. Z. D.) See formula No. 426, National Formulary (revised edition). Here is another:

Vanillin	2 drams
Coumarin	½ dram
Cologne spirit	1 pint
Distilled water	2 pints
Syrup	1 pint
Caramel, q. s.	

Dissolve the vanillin and coumarin in the cologne spirit, add the water, shake thoroughly, then add the syrup.

Sculptor's Putty (Modeling Compound).

(J. J. B.) The sample you submit is a mixture of clay, wax, etc. Try the following: Mix 200 parts dry clay or powdered soap stone with 100 parts of wheat flour; stir the mixture carefully into 300 parts of melted white wax, not too hot. If desired the mass may be colored at pleasure.

The so-called "modeling clay" may be made by kneading dry clay with glycerine instead of water. The mass must be worked thoroughly with the hands and moistened at intervals of two or three days. To prevent evaporation it should be kept covered with a piece of rubber cloth.

German Pharmaceutical Journals.

(F. R. D.) The following pharmaceutical journals are published in Germany: Annalen der Chemie und Pharmacie, Heidelberg; Apotheker und Drogist, Bunzlau; Apotheker Zeitung, Berlin; Archiv der Pharmacie, Berlin; Berichte der Pharmaceutische Gesellschaft, Berlin; Chemiker und Drogist, Leipzig; Deutsch Drogisten-Zeitung, Berlin; Drogisten Zeitung, Leipzig; Internationaler Pharmaceutischer General-Anzweiger, Hamburg; Journal der Pharmacie von Elsass-Lothringen, Strassburg; Pharmaceutische Centralhallefür Deutschland, Dresden; Pharmaceutische Wochenschrift, Berlin; Pharmaceutische Zeitung, Berlin; Suddeutsche Apothekerzeitung, Stuttgart.

The Manufacture of Phenacetine.

(F. R. D.) You cannot make phenacetine under any name or by any process in the United States. The name "phenacetine" is protected by trade-mark and the process of producing it by United States patent. Nor can you purchase or deal in any phenacetine which is not secured through the American agents for the owner of the United States rights. If you want to know how the article is made you can find it described in the United States patent and in various works of reference, but this will do you no good, save in the way of information. The position of affairs has been pretty fully set forth in our news pages numerous times during the past year or so, and we refer you to Feb. 11 Era, page 180.

Aqua Vitæ; Hematis.

(E. J. H.) In further reply to your query in this journal, March 11, 1897, page 302, W. S. Allen, Reidsville, N. C., says: "The prescription

Aqua vitæ	2 ounces
Hematis	1 ounce
Quicksilver	1 dram
Liquid storax	2 drams
Camphor	2 drams

is for a preparation used by showmen to anoint the bottoms of their feet to enable them to walk or dance on red hot iron. The first two ingredients are apple brandy and common extract of logwood, respectively."

Fred Ives, Ogdensburg, N. Y., in commenting upon the same subject, says: "Aqua vitæ is an English prescription in the London Pharmacopœia of 1677, and it is republished in Redwood's Dispensatory of 1848. By 'Hematis,' I think, is meant Hematitis Lapis, a reddish-brown peroxide of iron."

To Clean and Polish Marble.

(J. W. J.) The marble of your soda fountain may be cleansed with the following:

Sodium carbonate	2 ounces
Chlorinated lime	1 ounce
Water	14 ounces

Mix well and apply to the marble with a cloth, rubbing well in and, finally, rubbing dry. It may be necessary to repeat this operation. The marble may now be polished by rubbing over with kerosene. It should not, however, be applied to white marble.

Another method published a number of years ago in the Scientific American directs that the marble be rubbed with the following mixture: ¼ pound of soft soap, ¼ pound of whiting, 1 ounce of soda, and about ½ ounce of blue vitriol. Apply with a piece of flannel and allow the mixture to remain 24 hours. Wash off with clean water and polish the marble with a piece of flannel or an old piece of felt.

Powdered Flavoring Extracts.

(B. W. B.) By "powdered flavoring extracts" is generally meant the preparations obtained by triturating the various volatile oils with sugar, after the general formula given in the National Formulary for "oil sugars." Under the title of "oleo-sacchara" the work named directs the following, which is practically identical with the formula under "Eleo-sacchara" in the German Pharmacopœia:

Volatile oil	1 drop
Sugar	2 grams

Triturate the sugar with the volatile oil to a fine powder.

The oleosaccharates are intended as a pleasant aromatic vehicle for administering medicinal substances in powder form. Those prepared from volatile oils should be freshly made when wanted for use. Only the best quality of fresh volatile oil should be employed, as old resinified oils impart a bitter, unpleasant taste, as well as terebinthinate odor, to the sugar.

Remedies for Tapeworm.

(J. K.) For the expulsion of tapeworm a mixed treatment by pomegranate bark, pumpkin seeds and oleo-resin of male-fern is preferred by many practitioners. The following formula has proved very efficient:

1.) Pomegranate bark, 2 ounces; water, 1½ pints, boiled to 7 ounces; pumpkin seeds, deprived of their outer coats and beaten to a paste with fine powdered sugar, 1 ounce; oleo-resin of male-fern, 30 grains. Make an emulsion of the oleo-resin with acacia and the above decoction of pomegranate, add the pumpkin seed paste and add any flavoring syrup up to 9 ounces. Potter says that one-third of this mixture may be taken in the morning after a light diet and a laxative on the previous day. If not successful, the second and third portions may be taken at intervals of three hours.

2.) A new remedy lately recommended by Renshaw is croton-chloral. Here is his formula: Croton-chloral, 4.5 gm.; tragacanth, 0.1 gm.; acacia, 0.25 gm.; simple syrup, 25 drops. Make into 24 pills. Of these, four are to be taken at night, followed on the following morning by four more, on an empty stomach. One hour after this a light breakfast may be taken, followed by a cathartic, consisting of 100 gm. of infusion of senna with 15 drops of spirits of chloroform. (These pills should be freshly made before taking, otherwise they will become extremely hard and insoluble on standing.)

Some Chemical Reactions of Bismuth.

(W. O.) wishes to put up a liquid face powder. His formula directs to dissolve 8 ounces of bismuth subnitrate in hydrochloric acid. Precipitate with water, wash thoroughly (he uses about 30 gallons for this purpose), and add 32 ounces of prepared chalk and enough water or rose water to make 1 gallon. When this preparation is first made, it is satisfactory. After standing a few weeks, however, bubbles of gas appear and the mixture blackens. With precipitated chalk matters are still worse.

The first reaction taking place in the above is that producing oxychloride of bismuth, but we can hardly account for the color reaction. It seems to indicate, however, the presence of hydrogen sulphide or ammonium sulphide, either of which precipitates bismuth as a black sulphide. Where these compounds originate in this instance we do not know, but it is quite likely one or both have been or may be present in the store or laboratory where the mixture was allowed to stand. Again, they may have developed in the water used in making the mixture. Great care must be taken in the preparation of the various bismuth compounds to guard against just such contaminations. They are also quite susceptible to the action of light, and liquid preparations containing them should be kept in amber bottles.

We suggest you try the formula again. Use freshly distilled water and about 8 ounces of glycerin to each gallon of finished product. Keep the mixture securely bottled and protected from the light. A modification of this formula, which we have often dispensed, is this one:

Bismuth oxychloride	1½ ounces
Prepared chalk	3 ounces
Glycerin	1 ounce
Distilled water, enough to make	1 pint

Expectorant Syrup of White Pine.

(H. H.) says one of his physicians wants him to prepare a gallon of expectorant syrup according to the following formula, and directs him to use "no fluid extracts." How shall he proceed?

White pine	14 grains
Wild cherry	14 grains
Spikenard	2 grains
Balm of Gilead	2 grains
Sassafras	1 grain
Blood root	1½ grains
Ipecac	2 grains
Morphine sulphate	$^{8}/_{10}$ grain
Ammonium chloride	10 grains
Syrup, enough to make	1 ounce

Follow this process, the quantites of the various ingredients in the formula being calculated to produce one gallon of finished product:

White pine bark	1792 grains
Wild cherry bark	1792 grains
Spikenard root	256 grains
Balm of gilead buds	256 grains
Sassafras bark	128 grains
Blood root	192 grains
Ipecac root	256 grains
Morphine sulphate	$102^{4}/_{10}$ grains
Ammonium chloride	1280 grains
Sugar	6 pounds
Alcohol, Water, Syrup, of each, a sufficient quantity to make	1 gallon

Reduce the vegetable drugs to a moderately coarse (No. 40) powder, moisten the powder with a menstruum composed of one volume of alcohol and three volumes of water, and macerate for twelve hours. Then percolate with the same menstruum until one-half gallon of tincture has been obtained, in which dissolve the sugar, morphine sulphate and ammonium chloride, and add enough syrup to make the whole measure one gallon. Strain.

Bleaching Sponges.

(C. E. T.) Ordinarily sponges are cleaned and bleached by the use of permanganate of potassium, followed by a solution of sulphurous or hydrochloric acid. This is substantially the process adopted by the National Formulary, a method which satisfactorily whitens the sponges, but often partially destroys their tissues. Sometimes the sponges are first soaked in dilute hydrochloric acid and then treated with the permanganate. In bleaching, the first thing to do is to clean, wash and squeeze out the sponges. They should be well beaten to get rid of sand and loose earthy matter, soaked in water for some hours, then squeezed dry, and placed in a tub containing dilute hydrochloric acid. After remaining in this solution until all effervescence is over and no hard particles are seen or felt—stirring them about with a stick is useful to hasten the process—they should be well squeezed and transferred to a pan of water under a running tap. Next, the sponges are placed in a 2 per cent. solution of potassium permanagante. After soaking them for a few minutes—the exact time can be best judged by the color, which ought to be dark brown—they are to be removed, again washed, and put into another tub of solution of half a pound sodium hyposulphite and one ounce oxalic acid to one gallon of water. Here the sponges soak for about fifteen minutes. Finally, take them out and wash them thoroughly. By this treatment the sponges are rendered perfectly white and remain so. Many sponges contain a more or less dark-colored core, and if treated only with permanganate and acid the core is either not bleached at all, or if bleached somewhat, the tint is apt to grow darker again. By the combination of the three solutions every portion is thoroughly and permanently whitened.

Roeser claims that bromine water is preferable for bleaching sponges, especially after being used in surgical operations. The sponge is thoroughly disinfected and may be put through the process eight or nine times without destroying its texture. His method is this: Wash the sponges in warm distilled water (not above 150° F.) which contains in each liter 20 drops of 10 per cent. solution of caustic soda. After thoroughly treated in this manner, they are drained and placed in vessels containing the bromine water, which is made by adding 30 grams of saturated aqueous solution of bromine to one liter of distilled water. Leave the sponge in this solution until it is discolorized, and repeat with fresh bromine solution until it is thoroughly bleached, which is hastened by warmth and exposure to sunlight. After removal from the bromine bath, squeeze the sponges well and immerse them in a dilute solution of soda (20 drops of a 10 per cent. solution to the liter), and lastly wash out all traces of bromine odor with distilled water.

Graduation in Chemistry.

(Enquirer) asks how many sessions of study will be required of a student to become a graduate in chemistry. Also how many sessions will be required of a graduate in pharmacy to become a graduate in chemistry?

Answers to these questions depend upon a number of considerations, among which are the intellectual equipment of the student, the character of the educational institution attended, the particular course of such institution in which chemistry is the leading study, the particular degree desired, etc., etc. Nearly all of the universities and technical schools conferring degrees (Bachelor of Science in Chemistry, etc.) require an entrance examination equivalent to graduation from a high school or an academy. The student must pass these examinations whatever course (as a candidate for a degree) he may take. The length of the course of instruction then depends upon the branch of chemistry he wishes to follow. If it be his aim to equip himself to follow chemistry as a pursuit he will become most likely a candidate for the degree of B. S. in Chemistry. This course will require of him four years' study, chemistry being the leading subject, with modern languages, mathematics, general science, etc., adapted to his professional purpose. Other courses in chemistry are offered, as chemistry applied to metallurgy, mining, mechanical engineering, electricity, biology, toxicology, etc., which lead to a B. S. degree, the time service and study being about the same as that required for the same degree (B. S.) in general science. Almost all of our great universities and polytechnic institutions provide courses of this character, and it is from them you can secure full information for the asking. Just how much credit may be allowed for the course in pharmacy (Ph. G.) you have already taken we do not know. The courses in chemistry offered by various colleges of pharmacy are far from uniform, some have no educational entrance requirements; others have courses in which the time spent in study and laboratory work varies from two to three years of six to nine months each. As a result the equipment in general science, and chemistry in particular, of the average graduate in pharmacy is an unknown quantity. The ability, therefore, of the graduate in pharmacy to take up, as a candidate for a degree, scientific studies, and the credit he may be allowed for the work he has already accomplished in chemistry as applied to pharmacy, must be determined by the institution he seeks to enter. As you are a resident of Louisiana we suggest you write to the dean of the scientific department of Tulane University, New Orleans. Institutions in the North offering instruction in almost any line of chemistry are Columbia University, New York; Brooklyn Polytechnic Institute, Brooklyn; the Scientific School, Harvard University, Boston; Yale University, New Haven, Conn.; Johns Hopkins University, Baltimore; Michigan University, Ann Arbor, Mich.; University of Chicago, Chicago.

DYNAMOGEN.—An active, agreeable blood preparation, intended as a tonic for invalids and children.

ARGENTOL.—A compound of silver and oxychinolin of the formula $C_6H_6N.\ OHAg$, which possesses antiseptic properties useful in ointment or solution.

IODANISOL ($C_6H_4—OCH_3.\ I.$)—This forms a reddish yellow crystalline mass, which fuses at 47° C., and is soluble in alcohol and ether. It is intended as an antiseptic.

SAGRADIN.—A 20 per cent. solution of extract of cascara sagrada, which has been deprived of its bitterness, to which is added 2 per cent. of spiritus menthæ piperitæ.

IMPORTANT.

National Wholesale Druggists' Association,

Philadelphia, March 15, 1897.

To the Members N. W. D. A. and other Wholesale Druggists:

It has been suggested to this committee by several of our members that we should issue a circular letter concerning two articles which wholesale druggists have recently been asked by the makers to handle, both of which, so far as decisions have been rendered by the courts up to the present time can legally be handled, but which undoubtedly come under the ban of the resolution adopted by the N. W. D. A. at its meeting in 1887, reading as follows:

> "Resolved, That it is the duty of the members of this association to recognize the validity of the trade marks of proprietors, and to discourage the sale of such goods as may be fairly considered infringements."

Which resolution and those following, adopted at the same time, although not since re-adopted at all annual meetings, must still be considered as being in force, for the reason that the committees provided under these resolutions to be appointed by our association and the Proprietary Association were both re-appointed at the last annual meeting, which committees will doubtless in due course act upon the cases to which it has been deemed best that we should promptly call the attention of our members.

One of these articles is the "Pitcher's Castoria," offered to the trade by a concern styling itself "Castoria Company," of Fargo, N. D., who, in a circular recently issued to the trade, used the following language, viz.:

"We do not, under any circumstances, wish our goods to go to the retailer or consumer when the goods of the Centaur Company are specified."

It would seem as if the Fargo concern might possibly have found some name other than the one hitherto used by the Centaur Company, and to establish which that company and its predecessors spent hundreds of thousands of dollars in advertising and other efforts to make it the well-known household remedy it now is. They must know perfectly well, also, that by reason of this name being so popularized, 999 orders out of every 1,000 are written for "Castoria" simply, and neither the name "Centaur Company's," nor "Fletcher's," nor "Pitcher's" is mentioned in such orders.

The committee hopes, therefore, that our members and the wholesale drug trade in general will not, in any manner, countenance this article unless it is offered under some other name not so manifestly calculated to greatly injure the value of the established article.

The other article to which our attention has been called is the "Garfield Fig Syrup." Of this we know but little, but we think we are justified in stating that the Garfield Tea Company, who have created a very large demand for their tea, would protest very energetically if some other Garfield were to go into the market with a tea under the same name. It may be well to state, in this connection, that the California Fig Syrup Company, which popularized the name "Syrup of Figs," has always, to the utmost of its ability, protected both the wholesale and retail trade in the sale of its preparation; and while we regret to have to state that the Centaur Company has not given us that full measure of co-operation in maintaining contract prices, which our members have a right to expect, yet we believe that they will, by the honorable action on our part above suggested, be led to see the importance of the co-operation which the wholesale trade is pledged, by the resolution of the N. W. D. A. above quoted, to give them by refusing recognition of the Fargo article, whose manufacturers seek the wholesale druggists as a channel to float their preparation. Whatever the result in this regard may be, the action recommended is right in principle, and for this reason merits our heartiest support. Yours very truly,

M. N. KLINE, Chairman.

OVADIN.—A dry extract, containing iodine, prepared from the ovaries of swine and cattle.

THE DURABILITY OF RAW SILK is, according to an English patent, materially increased by treatment with formaldehyde, then after washing, the last traces of aldehyde are removed by treating with ammonia.

PURE OXALIC ACID.—A very pure oxalic acid may be had by recrystallizing from ether. The commercial sample is extracted in a Soxhlet's extraction apparatus by means of ether, whereby the impurities, such as the potassium and calcium salts, remain behind in the cone of the apparatus.

THE PHARMACEUTICAL ERA

[*WEEKLY.*]

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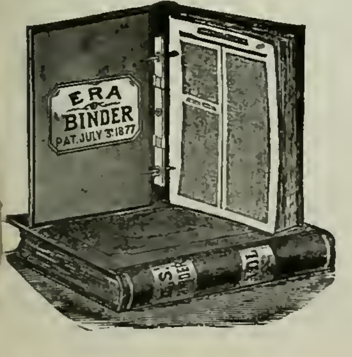


Get Uncle Sam After Them.

The attention of the postal authorities in this city has been called repeatedly to the fact that an organized gang of swindlers is using the mails to defraud the drug trade. Their operations have been fully related in these pages. A pompous representative of the powers that be told a gentleman who complained of their operations that he did not doubt in the least that the state of things was as represented, but he coolly added that the department would not take any steps to punish the scoundrels until the victims definitely established the existence of a conspiracy to defraud. This was a facer, for the complainant had always humbly believed that on a charge of fraud the Government's duty and desire were to investigate fully and punish severely. To be told to do this work himself was a disagreeable revelation of the attitude of the authorities. The drug trade is heartily disgusted with the lack of backbone on the part of the postoffice, but hopes for better things from the new administration. We are to have protection in name; let it be in fact also. Here is an opportunity to protect a most important industry. Will the new postal inspectors wipe out this lot of thieves, or will they expect the drug merchants and manufacturers to go into the detective business for them? It is a shame that these swindling rascals find it possible to carry on their schemes. It is possible, not only because some drug trade men are "good things," but especially because the authorities do not follow them up as closely as they should. The Croshers, Gerrishes, Meyers and others of that ilk should be sent to jail and kept there, and the Post Office Department can do it if it wishes.

Successful (?) Cutters.

One often hears the remark that So-and-So, the cutter, is doing an immense business, and must be making money. One of our correspondents hazards the statement that this conception is not always supported by the facts; on the contrary, he says: "Is it not strange that every one of the leading cutters is either 'in hands of receiver,' 'has failed,' or 'is in financial trouble?'" He cites as proof that the leading cutter in Charleston, who utterly demoralized the trade of that city, is in "financial trouble"; that the "aggressive cutter" of Washington has failed; that the cutter in Chicago who boasts that he sells as much patent medicines as any fifty druggists of that city (because the "fool druggists" do not follow his methods), got into deep water a year or two ago, and is still in a receiver's charge. Is this the brilliant result of aggressive cutting? Does aggressive cutting mean the cutting down of creditors' claims by assignment, receivership or similar brilliant financiering? Shall the honest and honorable druggist follow these illustrious examples and do business by cutting down honest debts? As it looks to our friend, the majority of our druggists are not aggressive, but stick to the old-fashioned, fossil theory of paying honest debts in full, not cutting them in half by failures, assignments or by disputing mortgages.

This charge, by inference, of dishonesty which is brought against the cutter is rather strong, somewhat overdrawn. Not all are dishonest, and some succeed financially, but there is enough of truth and facts for a groundwork for our friend's jeremiad. Cutting does not pay, as a rule, and enough examples of the rule may be discovered to prove it. The principle upon which cutting is conducted is opposed to sound business methods, and for every cutter who succeeds financially, a dozen or a hundred other dealers must go down with the wrecks of their business.

Be Calm, Gentlemen.

It is unfortunate that this recent substitution discussion has been directed into personalities. Even some of the pharmaceutical journals appear to be searching the unabridged dictionary for new and cutting epithets to hurl at the wicked patent medicine man. Nothing can be gained by calling the proprietors blacklegs and cutthroats, or for them to characterize all druggists as frauds and substituters. The proprietors have had their lesson. They realize that it is to their interests to have their goods handled by the drug trade. The department stores who started out as such big customers are now the worst substituters. People have more confidence in drugs that they buy at a drug store. The problem is to restore prices and to keep these goods from the outside dealers. Each man blames the other fellow for present conditions, and in order to start right it is necessary to make a fresh start. What has been had better be forgotten, and attention devoted to what can be done. Nothing can be gained by the 'You're another' style of argument. This patent-medicine-cut-rate-substitution question is solely a business proposition. Patent medicines are going to continue to be sold—who shall sell them? If the druggist, then he must be protected in their sale. Get together on a business basis, gentlemen, and don't indulge in Kilkenny cat tactics. You remember what became of those cats.

Duties of Members.

It is sometimes impossible to escape the conviction that members of an organization consider their duty to it discharged in full by the prompt settlement of dues and other fees. This is quite noticeable in pharmaceutical associations. A few attend the meetings and do all the work, whatever is done; the great majority remain at home and criticize the faithful few for their sins of omission and commission. Is it any wonder that many of the aims and purposes of these organizations are not accomplished? The grumblers are, almost without exception, those who rarely or never attend the meetings, or if they are present, do not join in the discussions.

We all agree that organization is a good thing; that it is often the only way to correct certain abuses. This being conceded, it is obviously the duty of every one within the organization to do all and whenever and wherever he can to further its purposes. Each member is a link in the chain, and the chain is only as strong as the weakest link. Retail pharmacists have for years been urging organization as a sovereign balm for all their woes. We honestly believe that if each and every one had done his duty in and toward the local, State and national associations to which he belongs, the drug trade were not to-day in the condition of demoralization which is so noticeable.

"Many a mickle makes a muckle," and great deeds may be accomplished by the union of little forces and agencies working in one direction. The time for the annual meetings of the various State pharmaceutical associations is close at hand, and if their value and success as working agencies depend on any one thing it is the unanimity of aim and action of their individual membership. So we say to each member: You are as essential to the organization as it is to you. Attend its meetings, or if compelled to be absent, send in a few written suggestions to demonstrate your interest in the organization. This will interest and stimulate others, will tend to bring out many a bright and original idea of service to all. The retail druggists, through their associations and aided by the pharmaceutical journals, have it in their power, if they will only exert themselves, to place their profession on the footing all so much desire. Nearly all the non-professional callings have their unions, by which they enforce their rules and effect reforms. The druggists can do as much, and they should consider it a personal duty, as well as a privilege, to belong to the pharmaceutical associations and serve in them actively and constantly. Attend the meetings and make your association a success.

The Color Line at the Fountain.

The only colored member of the Illinois Legislature has introduced a bill entitling colored citizens to enjoy rights of citizenship at soda fountains and other public eating and drinking places and resorts. This grows out of the fact that last year a druggist was sued for refusing to sell soda water to a colored person, and won his suit, which the higher courts confirmed.

It seems to us that this is a matter which cannot well be settled by the courts or the law. The colored man has as much right to life, liberty and the pursuit of happiness as any other man, but no more. The merchant has the right, or should have, to sell to whom he chooses. If he deems it policy, for any reason sufficient to himself, to refuse to sell to any individual or class of individuals, this certainly is his privilege. It is not the part of wisdom to force oneself in where one is not wanted. If Illinois druggists are forced against their will to sell soda water to colored people, it is a possibility that the beverage may be made distinctly disagreeable; syrup of squills might be employed for a flavor.

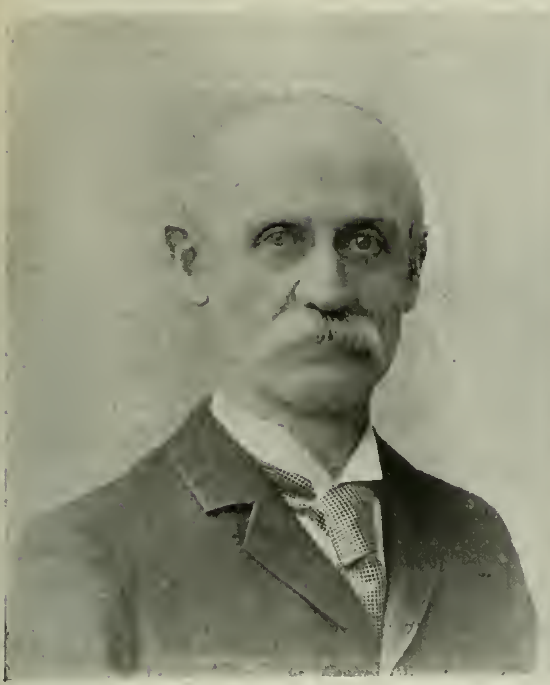
But this is all a tempest in a teapot, anyway, and, law or no law, there will probably be no very serious trouble in Illinois. The colored people will very quickly give the go-by to the druggist who intimates he does not want their trade. This is entirely a matter for adjustment by common sense and good business policy, not by legal measures.

Importers of Toilet Preparations Protest.

Importers of toilet preparations containing alcohol, such as hair tonics, face washes and dentifrices, eau de quinine, brillantines, etc., are far from satisfied with the proposed tariff changes contained in the Dingley bill. Under the Wilson tariff law these goods were not classified as alcoholic, and were admitted under a 40 per cent. ad valorem duty, several decisions of the United States courts confirming the right of the importers to have the goods so classified. Under the proposed new law, however, the goods are classified as alcoholic and subject to the same rate of taxation as perfumery. The importers intend to send representatives to Washington to protest against this classification. They say that such goods as they import contain only about 40 per cent. of alcohol, the remainder consisting of about 15 per cent. of medicinal ingredients and 45 per cent. of water. They protest against paying a tax on water. A certain hair preparation for instance comes in as toilet preparation at a duty amounting to from 30 to 35 per cent., according to the size of the bottles containing it. Under the proposed Dingley bill it will have to pay duties, specific and ad valorem, amounting to from 142 per cent. to 164 per cent. Such a law is expected to increase the price of imported toilet preparations, so as to stimulate the home production of such goods.

How about a tariff for revenue only?

BENZACETIN (Aceto-amido-salicylic acid). — This body unites with such bases as lithium and forms soluble salts, which act as prompt antineuralgics. In doses of ½ to 1 gram benzacetin acts as an effectual hypnotic and sedative in hysterical, nervous and anæmic patients.



Theodore Earle Studley.

The subject of this sketch is unique among druggists, having commenced his business life at the age of twelve years in a retail drug store in his native town, Worcester, Mass., which was then a village. Coming to New York in 1856, he entered the rubber business through the New Brunswick Rubber Company, and for over forty years in the several business connections successively formed, as the partner in the firms of H. G. Norton & Co. and Sargent, Studley & Co. and the manager of the druggists' department of the Goodyear Rubber Company, his intimate association with retail druggists has been continuous.

About twenty-five years ago, while of the firm of Sargent, Studley & Co., he became confidential agent and attorney for the proprietors of the house of Lubin, taking out their trade-mark and representing them in this country in all matters pertaining to the prosecution of counterfeiters of their goods or labels. He has continued the connection ever since, and Mr. Studley states that at present there are several such suits in progress in different parts of the country.

Having been so long and so intimately associated with the business, it seemed to be the logical necessity that he should take the representation of it last September when the Paris house decided to establish a branch office here, and it is conceded by those qualified to judge that he is the right man in the right place. The office is at 42 East Fourteenth street, overlooking Union square.

Mr. Studley's reminiscences of the drug side of the rubber business are very entertaining. For instance, he says that water bottles, now sold in enormous quantities, even down to thirty years ago were sold in less quantity than two gross per year throughout the United States. So in the line of syringes of both hard and soft rubber and of all other goods of the same kind which have been introduced to the market during his connection with the trade. Inclined to conservatism in business methods, he is the proper manager of a house which, with the current year, completes its century of existence. He is not quite of the old school, and yet is rather reluctant to believe hat the "hustlers" of the new have found all that is best in the ways which lead to success, or that the department store system is the perfect flower of our civilization.

Mr. Studley resides in New York with his family. He has two daughters, one of whom is married. He is a member of the New York College of Pharmacy. He was one of the organizers of the Union League Club in the days when it stood for patriotism, but is not now a member of it. He is also a member of the New England Society of this city.

Correspondence.

We are pleased to publish here communications from our readers on topics of interest to the drug trade. Writers are requested to express their views as briefly as possible. Each article must be signed by its writer, but his name will not be published if so requested.

An Advocate of Early Closing.

To the Retail Chemists of New York City and Brooklyn.

Gentlemen—For near thirty years I have been intimately connected with the practice of medicine and pharmacy in New York and its immediate vicinity, and for many years I have been impressed with the cruel, brutal and inhuman manner in which we act towards each other in the matter of early and Sunday closing of our stores.

In no other country or nation on earth are the pharmacies kept open so many hours as in the United States, and I am confident that the selfishness of the owners of drug stores is entirely to blame in the matter. No truthful reason can be given why we should be called upon to keep our stores open to the public from eighteen to twenty-four hours. Physicians are not called upon, except in very urgent cases, to visit after evening hours, and 'tis only from the fact that the selfish public are fully aware of the fact that Mr. Moses Katachaalhecan, the corner druggist, will assuredly be open until the midnight hour, that they defer buying their five grain pills or powders 'till they are ready for bed. It is this class of customers that keep us open, and I am convinced that no honest man who has any experience of city pharmacies can refute this statement.

The intense selfishness of ourselves and neighbors, the bare thought of Chemist Donna Blitzen being able to capture a few more pennies than we, is what keeps our stores open day and night, and certainly not the necessities of the public.

The accursed liquor drinking at soda fountains that has crept into our business places, has in a great many instances demoralized our druggists, from Maine to California; every device is resorted to and suggested in the variety of drinks offered over the marble counter, making our otherwise respected pharmacies little less than open, bare-faced, liquor saloons.

A month ago I closed my city store from 11 A. M. 'till 5 P. M. Sundays, and every week day at 10 P. M. My returns have increased every Sunday since doing so, and I propose to continue, although I am completely surrounded with pharmacies of the cut-throat German order.

No, gentlemen, one and all, are you willing to close every night at 8 P. M.? If so, the only way to do it is to close at once. If you will consent to be less selfish and have more liberalism in your souls than you now appear to possess, you will earn the lasting gratitude of a large body of men clerks, improve your own health, save unnecessary gas bills, and become once more respected by a community whose chief interest is self.

Believe me, brother pharmacists, a determined opposer of oppression, in every form. C. C. C.

Commercial Section of the A. Ph. A.

Cleveland, Ohio, March 20, 1897.

To the Editor:

You may be right or wrong in your statement of the facts that the commercial section of the A. Ph. A. has accomplished no great good in the past eight years. I leave the answer to this serious charge to those who know what it has tried to do, how far it has been instrumental in doing good, and whether the amount of good done has resulted in such things as cannot as well, if at all, be accomplished by other means.

Your accusation carries with it the suggestion to break down the commercial section of our national organization without any suggestion as to improving it first, or of substituting for it something which can be expected to do what it cannot.

I do not believe in tearing down an organization where it is not doing any harm and is capable of doing much good. Patience is a virtue.

The editor of a journal, to command the confidence of his subscribers, must build up and lead on, and not tear down, without the gravest of reasons. He should point out the causes of failure and suggest ways that will avoid failure. I do not think you have any justification for desiring the suppression of this branch of the A. Ph. A., which under wise guidance can do a world of good. In my late address to the Cleveland Pharmaceutical Association, I stated that I was sorry to see the various pharmaceutical associations lose sight of the fact that such fellowship was both of professional and business benefit to all, and that while we raise the standard of professional excellence, let us also raise the standard of business excellence, by the same unity of effort. We have to contend against an organized friend or foe—it is difficult to say which at different times they may be—namely, the Wholesale Druggists and the Proprietary Medicine Manufacturers, and between these two millstones we will be, if we are not there already, whereas we should be, by rights, the power behind the throne, regulating but not destroying both. The awakening is only just begun. The Era is right. Thus far patiently we have been waiting for the cut rate problem (in proprietary goods) to be met by great and tremendous effort on the part of the proprietors and wholesalers, in our favor, because they claim to see, as business men, as far as or further than we can the handwriting on the wall. But we have been met by mockery—the dozen price has been in a number of instances invariably increased, cutting down our margins, and the price to the public on the wrappers stricken off, so that the proprietary men need not be responsible for the price the druggist is in the future to get.

The Commercial Section has been too patient, and now that the scales are removed from their eyes, after years of valuable patience and experience, when they are about to strike, because the iron is hot—although it has taken long to heat—now comes a suggestion to put the fires out! No! By all means let us not forget the commercial side of our being—our very life—and surrender organization, effected already, to which delegates from all over the Union can be sent. Let us show that we have been patient but awake, and let me appeal to the Era, as a leader of pharmacy, to aid in arousing into action the commercial section of our pharmaceutical being, so that we will compel action and tremendous effort, instead of apathy and sleepy committees to investigate ways and means. I am for peace and harmony, but if that fails, I am convinced that there is integrity and resolution enough in the commercial being of every pharmacist to build up a perfect system of "millstones" of our own that could bring forth results—great results.

I have been suspicious that some of our drug journals have catered too much to their advertising patrons, and have failed to see that their subscribers' interests are the only true foundations for their continued success, and such journals have espoused the interest of these millstones, and suppressed statements derogatory to them, which should have been made known to their subscribers.

I hope the Pharmaceutical Era will not be guilty of a betrayal of the commercial interests of its patrons. In fact, no journal can afford it, in these days when the druggists gather at their local and State and national meetings, and can freely give vent to their opinion of the action of such journals in matters affecting the vital interests of the retailers.

Thanking you for your kindly consideration, I am yours respectfully,

NATHAN ROSEWATER, Ph. G., M. D.

Since writing the above, my attention was directed to a series of resolutions adopted by the Cleveland Pharmaceutical Association, Dec. 4, 1896, during my absence, advocating the sale of proprietary medicines exclusively, to such wholesale dealers only who will sign and enforce an agreement to sell to all retailers alike, at proprietors' fixed prices. One enumerated reason given is especially emphatic and prophetic, namely, "Self protection might move us to put our heads together and get up a full line of our own remedies, to be pushed by us unitedly" (unless properly protected by the proprietors). N. R.

The Doctor's Arguments Unsound.

Everett, Wash., March 21, 1897.

To the Editor: I notice an article which appears in the Era of March 11, entitled "Dispensing by Physicians Defended," and I wish through your columns to give my opinion concerning the arguments set forth therein. I do not intend to enter into any criticism with each particular reason given, as I do not wish to take up too much space; but I shall only call your attention to a few points in the article.

The physician writing this article has evidently had an experience with only a dishonest and incompetent class of druggists, and must have lived, for the most part, in the country, as he bases all of his arguments in favor of a doctor dispensing on these experiences. True, there are some druggists, and I am glad to say they are few, who would warrant the stand taken by this physician, but this is not a sound argument in defense of his theory, any more than that the whole medical fraternity should be condemned on account of some "irregulars."

In my opinion, every one of these nine reasons he gives can be traced to one of these three false premises, viz.: Incompetency in the druggist, dishonesty in the druggist, or the fact of being in the country. This latter reason, I admit, would be sound under some circumstances, but this is exceptional, and I do not think should be considered in this case. Taking away these assumptions, and what has the doctor left to rest his argument upon? Nothing, and, therefore, it seems to me that his whole argument has nothing to support it.

In conclusion, if there are any good, sound reasons for a physician dispensing his own prescriptions, they are certainly not shown in the article in question.

"SUBSCRIBER."

ANCIENT MEDICINE.

If modern science can boast of anything, it can of the way in which it has rescued medicine from the realms of imagination. The wonderful prescriptions of the Magi, as narrated by the Roman historian Pliny, are examples of what the earliest doctors were, while even the "salves" of our own Elizabethans seem, at first sight, not much of an improvement upon those of the Chaldean M. D's. Let us, says the London Standard, take a few examples of Magian healing from a Latin author of which, perhaps, the most useful is the following—one that in modern parlance would run thus: "A receipt to make women disclose their secrets. Take one hen, and having carefully extracted its heart, place the same on the mouth of the patient during sleep. You will ascertain her exact age the next morning." To do the old Roman justice, he stigmatizes this statement as a "portentous lie" (no doubt he had tried it).

Others are quite as grotesque. Feverfew, when used medicinally, had to be plucked by the left hand, after the patient's name had been spoken over it, the herbalist taking good care not to look behind him. A love charm could be easily obtained from a hyena caught when the moon was in Gemini. Sporting prophets who wish to excel in divination should change their customary chop for a few moles' hearts. It is stipulated that these be fresh. The Romans themselves, although no mean surgeons—they made use of the probe and nippers and instruments for trepanning—were not less given to prodigies than the people whose veracity they doubted. They believed that eating hare was a cure for insomnia; and even the sceptic Pliny imagined that there must be something in the superstition that people who had done so were good-looking for nine days afterward. A veritable nine days' wonder! He recommended also as a cure for quartan fever that the dust in which a hawk had rolled should be put into a bag, and the latter tied round the neck with a piece of red thread. Other cures for the same were the longest tooth of a black dog, in the same position, and a wasp caught in the left hand, and then pressed against the forehead. Alexander of Tralles, a physician of the Middle Ages, made use of a no doubt potent cure for the after effects of unripe apples and the such like. The sufferer wore on his finger an octagonal iron ring, upon which was inscribed the following: "Flee, flee, ho, ho, bile, the lark was searching." A remark which, if we may slightly alter Gilbert, "no doubt was very clever, but I do not understand it."

Leaving the Romans and Orientals we in vain turn to our own forefathers for a little more common sense. The Saxon leeches, having no knowledge of instruments or Indian drugs, fell back on weeds, which they dignified by the picturesque name of "worts," charms, and incantations, and portions of mutilated beasts. To spit in a frog's mouth and request him to make off with the toothache was their idea of dentistry. Motes in the eye were very easily curable. The unafflicted member was shut, and the "vexed" one touched with the ring-finger and thumb, while the following was repeated solemnly three times: "I buss the Gorgon's mouth." By bussing the Gorgon's mouth nine times you could get a bone from your throat. A potent charm! An excrescence on the eye known as hordeolum (probably a cyst) was removed by means of nine barley-corns. First the whole nine were held to the eye, then two were dropped, and seven held; and so with five, and three, and one, while at each application the self-healer repeated the words, "Flee, flee, barley thee chaseth." Blood was stanched by another and highly intelligible charm, "Stupid, stupid on a mountain went, stupid stupid was." Though who was stupid, and why he was so, perhaps the Anglo-Saxon who tumbled down a mountain was alone able to determine. Brutality was no deterrent to a man who was in pain. The prescription for cataract was one in which a fox was caught alive, his tongue cut out, and the animal let go; after which the severed organ was put in a red rag and suspended, until it died, round the neck of the human sufferer. For all who are subject to kernels behind the ears, I quote the following: "If a shrew mouse die in a rut, there, by a natural fate he perishes. So wrap him up in a clay, and with him go three times round kernels behind the ears. Wondrously quickly wilt thou heal them."

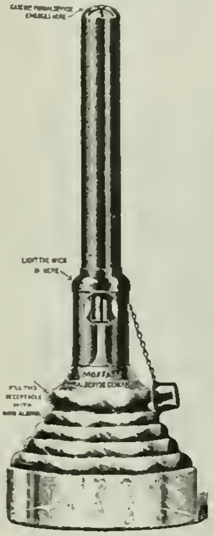
It will be interesting to note for what diseases some of the more common of our wild plants were once made use of. Poppy, as may well be supposed, was the cure for sleeplessness, though the application was external, and, to say the least, a lengthy process. One had to take ooze of the wort and smear the man with it. Soon you "sent soundest sleep on him." Toothache was got rid of with yarrow (Achillea), an herb which the Saxon leech tells us was given by Achilles to Telephos and others, in order to cure their wounds. It had to be eaten fasting. It might be supposed that the hardy warriors of the time in question did not suffer, as moderns do, from the disfigurement of baldness. The leech-books of the period, however, are full of recipes for this ill. Loose hair was remedied by the common water-weed Callicriche. "If a man's hair fall off, take the wort, pound it with oil. Smear then the hair therewith. It soon becometh fast." The desperate man, if he has a belief in antiquity, might do well in trying this.

Gout appears to have been as frequent among our ancestors as it is to-day, and to have been by no means introduced by the heavy drinkers that are just becoming extinct, however much it was increased by them. The leech-books give many remedies, from marshmallows pounded in old lard to a compound of honey and hymele (better known as hop,) "a wort which," as our authority informs us, "is so excellent that it is mingled in ordinary drinks." The strawberry had a virtue which must no doubt have endeared it to the English soldiers of the day, inasmuch as it was an antidote to inconvenience due to an overdose of any of the aforesaid compounds of hymele. Juice of the strawberry wort mingled with honey along with pepper "benefited much when drunk." The mullein, or high taper, a handsome plant with broad leaves and a spike of yellow flowers, had a use which must have sorely tried the credulity of those for whom it was prescribed. A twig of it, carried in a man's hand, prevented him from being terrified with awe; neither would any wild beast haunt him, nor any evil come near. The legend is that it was given by Mercury to Ulysses, who, after he had received it, was safeguarded against all the wiles of Circe.

A good deal of folk-lore appears to have become mixed up with even the most serious works of the heads of the Saxon medical profession. Their opinions on the mandrake are bewitchingly infantile. At night this plant was supposed to shine like a lamp, and to be endowed with motion, while the method of catching it suggests the elaborate machinations of a Thames roach-fisher. As soon as you sighted the twinkle of a mandrake plant, you stole up softly behind its back, and having inscribed it with an iron ring, lest it should flee from thee, you proceeded immediately to tie it hands and feet. This step accomplished, you called your "hound" (there is no mention of a special breed of mandrake hounds), and having tied the hungry beast to the plant by its neck, you set meat before "Ponto," who could not reach it, except he "jerked up the wart with him." Of the lettuce, it was said of the hare, when in summer he is tired with excess of heat, doctors himself with the leaves thereof. The hare, by the by, appears to have been an animal much studied by our Saxon ancestors. To meet three hares in one day was the presage of speedy death, while to catch a leveret was supposed to be the sign of an immediate acquisition of fortune. While naming the animals, however, that our ancestors killed and tortured in their search for health, we must give them the credit of discovering the use of one that has been of some importance in the eyes of modern doctors. This is the horse-leech, the name of which is derived from the Anglo-Saxon word for a physician. It was, in spite of this, but little used by them.

Formaldehyde as a Disinfectant.

The use of formaldehyde, or formalin, as it is trademarked, for purposes of disinfection, is growing in favor. This is due to the fact that the gas is at once very noxious to bacteria, and very innoxious to living animal tissues. It is stated by the highest German authorities that formaldehyde unites chemically with sulphuretted or nitrogenous products of fermentation or decomposition, forming new substances that are odorless, and in many cases antiseptic, thus destroying the food of bacteria as well as the bacteria themselves. Yet it does not discolor furniture or tapestries, and in moderate quantities is not harmful to the membranes of the throat and lungs of those who breathe it.


LIGHT THE WICK IN HERE
MOFFATT

Baeyer believes that formaldehyde is the natural protector of the tender sprouts put forth by growing plants, being generated by the action of sunlight on the carbonic acid and water of the air in the presence of the green coloring matter of leaves, according to the equation—

$$CO_2 + H_2O = CH_2O + 2O.$$

Subsequently it becomes the parent of the carbohydrate structure of the plant. It is from this property of combining chemically with albumenoid or nitrogenous bodies that formaldehyde derives its germicidal and bactericidal power, since bacteria and micro-organisms generally are not only albumenoid in character, but their food is mainly albumenoid.

The disinfecting properties of formaldehyde were first set before the public in 1890 by Berlioz and Trillat, and there are already several forms of apparatus for preparing it. One of the simplest and most convenient of these is the Moffatt generator here pictured, made by Eli Lilly & Co., of Indianapolis. In form it suggests the ordinary Bunsen burner. It is designed to burn wood or other alcohols in a limited amount of oxygen:

$$C_2H_6O + 2O = 2CH_2O + H_2O.$$

It is claimed for this apparatus that a room may be thoroughly disinfected with it without harm to the inmates of the room.

OZALIN.—A disinfectant containing ferrous sulphate, magnesia and caustic lime.

SOZOBORAL.—A mixture of aristol, sozoiodol and boric acid salts, which is intended to be used as a snuff.

IODOCRESINE.—A fine, voluminous, amorphous, violet, inodorous powder, which contains 54.4 per cent. of iodine. It is insoluble in water, and the dilute acids, also alcohol, while it is readily dissolved by chloroform, concentrated alkalies and carbon disulphide. Iodocresine is stable to light and air exposure, and is probably intended as an antiseptic.

(Special Correspondence)

FROM THE FRENCH CAPITOL.

Paris, March 16, 1897.

The French Herbalists.

The French herbalists, threatened with extinction by the new pharmacy law, are not inclined to submit without a struggle. They existed side by side with the apothecaries centuries ago, and the French pharmacist has ever vainly sought to suppress them. Now the Petit Journal (which claims the largest circulation in France) lifts up its voice against what it considers tyranny and monopoly on the part of the pharmacists, while the herbalists are banding themselves together to petition Parliament.

I venture to predict they will "die hard," especially if they keep to their ancient, if not indisputable, claim to be the "poor man's pharmacists." As a matter of fact, the herbalist is a person who has simply passed, before the School of Pharmacy, an examination on herbal remedies, and paid a fee of a hundred francs in exchange for a diploma.

The "herboristerie" is a familiar object to all those whose knowledge of Paris is not confined to the "show streets." It was in teeming ex-Communist Belleville that the above sketch was made. Over the door hang garlands of dried herbs, bedpans and sundries adorn the entrance, while the windows display trusses, canulas, elastic stockings, perfumery, poppy heads, the popular herbal remedies (mallow, coltsfoot, borage, etc.), side by side with reservoir enemas, and the hundred and one articles that do not come strictly under the head of "medicaments." The portly dame at the door is the herbalist—women are numerous in this trade, while in French pharmacies they are conspicuous by their absence; and as likely as not the lady customer has called on her for some articles which she has preferred to ask for from one of her own sex. Many of these female herbalists are midwives, and so make money at both ends.

It is evident that these little shops—kept by persons who have no educational expenses, and whose low rent and small wage value allow them to sell cheaply—deprive the pharmacist of much profitable business in side lines. And I may add that the humbler classes of Parisians inherit from their peasant ancestors much of that love for a "cheap cure" which ever exists beneath the French countryman's blouse, and largely patronize herbal remedies for minor ailments. What reader of "Trilby" does not remember how little Billee's kind landlady brought him up a cup of couch-grass tea ("tisane de chiendent) after his Christmas carouse, and how the sympathetic Ribot afterwards "fetched the pick-me-up from the chemist's unbeknown to Madame Paul," for that worthy dame would certainly have treated such an act as unnecessary extravagance. This is cleverly characteristic. I myself have seen a suffering middle class woman rouse herself to scold her husband for having fetched her some necessaries from a pharmacy. "You could have gotten them four sous cheaper at the herbalists', two blocks further on."

All this, and the temptation to which herbalists often cede to prescribe and sell medicaments, in spite of laws to the contrary and the vigilant "Disciplinary Committees" of the pharmacy syndicates, will explain the question at issue, which is likely to be as hotly disputed as the proposal to allow doctors to supply drugs in "urgent" cases.

But to pass to the pharmaceutical news of the month, which I am sorry to say, is mostly of a police-court and obituary nature:

A Pharmacist Murdered in the Mountains.

On Aug. 14, 1896, early in the afternoon, a Parisian journalist was strolling at the foot of the Puy de Gravenoire, a mountain which will be familiar to those who have admired the view from the terrace of the Casino at Royat. Entering a deep gorge known as the "Trou d'Enfer," he was horrorstruck to find a dead body, which proved to be that of M. Kauffmann, pharmacist, of Limours, near Paris. The trousers pockets turned inside out and a fearful wound on the nape of the neck bespoke foul play, while a sum of $80, still remaining in the breast pocket, seemed to indicate that the robber had been disturbed ere he could completely rifle his victim. A hotel bill and a tramway ticket showed that the luckless pharmacist had arrived from Vichy that very day, and had taken the electric car from Clermont Ferrand to Royat only an hour or two before his assassination.

Combes, a man of somewhat indifferent reputation, working on a farm not far away, has just been put upon his trial for the murder of Kauffmann, and the affair has caused much sensation both in the centre and at Paris, being one of those cases where the thread of circumstantial evidence finally leads to conviction.

The possession of a penknife, which Kauffmann's wife swore to as her husband's property, an unusually large expenditure of money on the day following the murder, some hairs found on a pickaxe, etc., were the chief proofs of the prisoner's guilt. His counsel warmly criticised the evidence of the microscopic and analytical experts, and it was proposed to call a second chemist, and a doctor, as witnesses; but the representative of the Government declared that "the court could not be turned into a laboratory," and asked the jury to compare for themselves a lock of Kauffmann's hair with the bloodstained hairs on the pickaxe.

The request of the jury to view the scene of the crime was, however, granted, and the court adjourned in carriages to the gorge in question. The spectacle of the judges and gendarmes holding session in the open air drew thousands of spectators; and it is stated that the thorns and mud played sad havoc with the crimson cloth and ermine of French justice.

After a long and exciting trial the verdict brought in was what would answer to the American term of "murder in the second degree;" and Combes was sentenced to fifteen years' imprisonment.

"Justice's Justice."

The French "juge d'instruction," who investigates cases before they are heard in public court, is an unpopular man everywhere, and it is to be feared that the charges of petty tyranny and carelessness of every right of a citizen, which are so frequently leveled against this class, are not always undeserved.

M. Saugeron, pharmacist, of Mamers (Sarthe), is the latest victim. Charged with dispensing without a doctor's prescription, he was imprisoned for four days, and then subjected to an official "instruction" (examination), which lasted nine months. At last (on Feb. 3), the case was publicly heard, and the presiding judge dismissed the pharmacist before his advocate had even finished his speech, with the remark that "the matter was quite clear." The "Gaulois" hints that if M. Saugeron had not dabbled in politics, and obtained election as a district councillor, he would probably never have been molested; and as the alleged illegal dispensing was of the most trifling character, this may be the key to the whole affair.

The Drug Clerk and the Spy Fever.

Assistant Pharmacist Plantefolle is less to be pitied, as he seems to have been the victim of his own thoughtlessness. Why he considered it advisable to confiscate half a dozen "quick matches" when discharged from the Versailles Artillery Barracks at the end of his Army service is best known to himself. At any rate, one of the fairer but frailer sex who charmed his leisure hours at Pantin (the busy manufacturing suburb where his pharmacy was situated) allowed her tongue to run too freely on the subject, and both Plantefolle and herself were arrested. Next morning the Radical, a Paris daily, had much to tell of a "Grave Affair of Espionage," and of "stolen munitions of war." We are rather surfeited with this sort of sensations here; as a matter of fact, the drug clerk and the lady were released the following day, and the matter reduced to the proportion of a somewhat stupid freak on the young fellow's part.

A Well-Armed Demonstrator.

Was there ever an effervescence in the "Quartier Latin" without the pharmacy student well to the front? Experienced observers incline to the contrary opinion. At any rate, a couple of students were prosecuted for undue enthusiasm on behalf of "gallant little Greece," and one of them was a future pharmacist. He was fined a hundred francs for "carrying prohibited arms," in the shape of a revolver and a knuckleduster, though it was not asserted that he attempted to use his weapons in any way.

The Month's Death Roll

is a heavy one. The loss of Professor Bourgoin, whose death I reported a few weeks ago, has left a gap in the ranks of pharmacy which it will take time to fill, and is especially felt at a time when his indomitable energy and high abilities might have rendered valuable services to those interested in the new pharmacy law.

Dr. Amédée Vée, honorary president of the Paris Pharmacists' Syndicate, was buried on February 6. After taking his degrees in medicine, pharmacy, and science, he succeeded his father in the well-known "Pharmacie Vée," in the Faubourg St. Denis, but in 1868 entered the wholesale drug trade. The Academy of Medicine, in 1865, awarded him the Barbier prize for his discovery of eserine, and he published works on calcined and hydrate magnesia, vanilla, etc. As member of the Paris Society of Pharmacy, president of the Chemical Manufacturers' Syndicate, and of the Central Committee of Syndicates, official "reporter" on Pharmacy at the 1878 exhibition, and member of the jury in 1889, he rendered many and valuable services to the profession, "the welfare of which," to use his own words, "is identical with the welfare of the public," and was highly respected for his sterling honesty and other qualities.

M. George Ville, professor of Vegetable Physics at the Paris Museum of Natural History (Jardin des Plantes), passed away on February 22, at the ripe old age of eighty-four. He belonged to a generation of pharmacists who have shone in the first rank of French botanical science. M. Chatin (whose portrait we gave last month) and M. Trécul, who died last year, were both fellow students of his. M. Ville started life at fourteen, in a pharmacy at Lyons, but soon found his way to Paris, where he took the first place in the yearly competition for hospital "internes."

His name is best known as a strenuous advocate of artificial manures. But although his scientific attainments were of no mean order, and he had illustrated his theories by actual experiment with plants at the Vincennes Agricultural School thirty years ago, yet many practical farmers still shake their heads at Ville's ideas of the uselessness of the old-fashioned farm manure, and hint that the same experiences extended over several acres of ground do not show the marvelous results produced on a small scale. Ville was a Southerner, eloquent and voluble when his favorite subject was broached, but somewhat dominating and uncompromising if contradicted. Many consider that though his theories were sound enough, his lively imagination may sometimes have induced him to draw exaggerated deductions therefrom.

Dr. Contejean's death at Bellegarde was one of those accidents which are often quoted by those who advocate a uniform and unmistakable shape or mark for all poison bottles and packages. Corrosive sublimate, swallowed in a glass of water in mistake for bicarbonate of potash, caused horrible agony, which skillful treatment prolonged for six days, but could not cure.

Tariffs for Analysis.

are now becoming common, as many French pharmacists take up this work, inscribing "Analysis Laboratory" on one of their windows, through which one may see a pair of testing scales and other instruments. The tariff is sometimes placed on a card in view of the passer-by, but frequently is to be found in the printed price lists which are becoming general. The following may be taken as minimum charges:

Complete analysis of urine, $4 to $10; dosage of glucose, or chlorides, or albumen, or sulphuric or uric acid, $1 each; micrographic examination of sediments or qualitative analysis of pathologic elements (sugar, albumen, etc.), $1. Complete micrographic and bacteriological analysis of saliva, $4; research of the tuberculous bacillus or the pneumonic diplococcus, $2; complete analysis of drinking water, $6 to $10; summary examination, $2; dosage of organic matters, $1; bacteriological examination, $10. I omit the tariff for beer, wine, vinegar, milk, flour, bread, manures and cements, jams and syrups, blood and gastric juice, but may just add that most of the known bacilli are hunted for at $4 apiece, while diphtheric membranes are examined for Kleb's bacillus at $2.

The time required for analysis of each class is sometimes stated, and a reduction is offered in one price list for persons ordering half a dozen at once.

LANIOL.—A preparation similar to lanolin, made by Hoffmann-La Roche & Co, of Basel.

IODANISOL (ortho-iodo-anisol).—A yellow to reddish crystalline mass, which fuses at 47° C., and is soluble in alcohol and ether. Iodanisol is intended as an antiseptic.

OVADIN.—A fine, pale rose colored powder, almost without odor or taste, insoluble in water, jellifies when boiled with dilute acetic acid. The ash contains 1.4 per cent. of phosphorus. The yield of ovadin prepared from the ovaries of cattle is 3 per cent., from the ovaries of swine 5 per cent. of the weight of the fresh organ. Iodine is found to the extent of from 0.00127 to 0.00482 per cent.

(*Continued from Page* 268, *March* 4, 1897.)

*LIST OF REACTIONS AND REAGENTS ACCORDING TO NAMES OF AUTHORS.**

OBERMEIER'S—Test for Indican.—The sample of urine is treated with a solution of lead acetate, the mixture filtered and to the filtrate a ½ per cent. solution of ferric chloride in fuming nitric acid (1.19 sp. gr.) is added, shaking. This mixture is then shaken with chloroform, which takes on a blue color if indican is present.

OLIVER'S—Test Paper for Albumin and Sugar in Urine.—For the detection of albumin filter paper impregnated with picric and citric acids or with sodium wolframate and citric acid, or with potassio-mercuric iodide and citric acid, or separate papers impregnated with potassium ferro-cyanide and citric acid.

For the detection of sugar—Papers impregnated with indigo-carmine and sodium carbonate may be used (separately).

OST'S—Solution of Copper as Sugar Reagent.—This contains 23.5 gm. of crystallized copper sulphate, 250 gm. of sodium carbonate and 100 gm. of potassium bicarbonate in 1,000 cc. of water.

Compare Soldaini's Solution.

OTTO'S—Test for Picrotoxin.—Into the yellow solution of picrotoxin in concentrated sulphuric acid, a drop of a solution of potassium bichromate is dropped; the zone of contact is colored red-brown; when mixed the solution is colored green.

OTTO'S—Morphine Test—A solution of morphine gives with a mixture of hydrochloric acid, ferric chloride and potassium ferricyanide a precipitate of Prussian blue.

OTTO'S—Modification of Fehling's Solution.—A solution of 1 part of copper sulphate and 3 parts of tartaric acid in 20 parts of water, to which a concentrated solution of sodium hydrate is added until a clear solution results.

PACINI'S—Mounting Fluids for Microscopic Sections.

I.	Mercuric chloride	1 part
	Sodium chloride	2 parts
	Glycerin, 25° B.	13 parts
	Water	113 parts
II.	Mercuric chloride	1 part
	Acetic acid	2 parts
	Glycerin, 25° B.	43 parts
	Water	275 parts

PAGEL'S—Test for Phosphorus in Phosphoric Acid.—On warming the sample with a solution of mercuric chloride, a reduction (ppt.) to calomel takes place if phosphorous acid is present.

PANUM'S—Test for Albumin.—The urine, acidified with acetic acid, is boiled with a saturated solution of sodium sulphate or sodium chloride; if albumin is present, coagulation takes place.

PAUL'S—Test for Biliary Colors.—The sample of urine is colored with methyl violet; if, on standing, the violet color changes to a blood-red, biliary colors are present.

PAPASOGLI'S—Test for Cane Sugar.—See Reich's Test.

PAVY'S—Test for Glucose.—Crystallized copper sulphate 4.158 gm., Rochelle salt (cryst.) 20.4 gm., caustic potassa 20.4 gm., are dissolved in water, 300 cc. of aqua ammonia (0.88 sp. gr.), are added, followed by water sufficient to make 1,000 cc. Each 10 cc. of this solution correspond to 0.005 gm. of glucose. When all of the copper has been reduced the solution becomes colorless, hence is adapted for volumetric estimations.

Compare Fehling's Solution.

PELLAGRI'S—Morphine Test.—Morphine is dissolved in concentrated hydrochloric acid, a few drops of concentrated sulphuric acid added, and the mixture evaporated; a purple color is produced. If a little hydrochloric acid is added, then acid carbonate of sodium till alkaline, followed finally by a few drops of tincture of iodine; the solution is colored a deep emerald green.

PELLET'S—Volumetric Glucose Estimation.—This is made by means of the following solution: Copper sulsulphate, 68.7 gm.; sodium chloride, 200 gm.; anhydrous sodium carbonate, 100 gm.; ammonium chloride, 6.87 gm., dissolved in hot water, diluting to 1 liter. Each 10 cc. of the solution are reduced by 0.05 gm. of glucose.

PELOUZE'S TEST.—See Moore's Test.

PENZOLDT'S—Test for Acetone in Urine.—A few crystals of ortho-nitro-benzaldehyde are dissolved in water and added to the distillate of the sample of urine, which is then made alkaline with sodium hydrate solution. In presence of acetone the mixture turns yellow, then green; finally, after a few minutes, indigo precipitates.

PENZOLDT'S—Test for Sugar in Urine.—This is carried out by aid of Ehrlich's Reagent. The urine is made alkaline and treated with diazo-benzol-sulfonic acid solution (1 : 60), a control test is made at the same time with a sample of normal urine. The latter is colored yellowish-red, while glucose urine soon turns a dark red and becomes opaque.

PENZOLDT'S—Test for Naphthalin Urine.—On adding sulphuric acid to a trace of naphthalin urine, the floating layer of the latter will take on a dark green color; later the acid becomes colored.

PERENYI'S—Hardening Fluid.—A solution of 4 volumes nitric acid (10 per cent.), 3 volumes of alcohol and 3 volumes of chromic acid solution (½ per cent'), used for hardening microscopical preparations.

PERROT'S—Test Reagent for Volatile Oils.—A solution of di-methyl-anilin-violet in glacial acetic acid and dilute alcohol. This reagent gives characteristic colors with ethers, aldehydes, phenols, etc. It does not react with the fatty oils and hydrocarbons.

PERSOZ'S—To Distinguish Textile Fibers.—The solution employed is prepared by dissolving 10 gm. zinc chloride in 10 gm. of water, shaking the solution afterward with 2 gm. of zinc oxide. The textile fibers are digested in this zinc-oxy-chloride solution at 30° to 40° C.; the silk fibers are dissolved.

PETTENKOFER'S—Test for Gall Acids.—On adding concentrated sulphuric acid to the sample of urine containing some cane sugar, an intense purple-red color is produced.

Strassburg's Modification.—Some cane sugar is dissolved in the urine, in this filter paper is dipped and then dried; sulphuric acid when dropped upon this paper will produce a red color.

Drechsel's Modification.—This consists in employing phosphoric acid in place of sulphuric acid and warming the solution.

Udransky's Modification.—In place of cane sugar and sulphuric acid furfurol-sulphuric acid is employed.

The Pettenkofer's test can be employed for the detection of sugar, as in glucosides. See Brunner's test for digitalin.

PIRIA'S—Tyrosin Test.—The urine sediment in question is warmer with a little concentrated sulphuric acid, diluted, neutralized with calcium carbonate and the filtrate treated with ferric chloride. If tyrosin is present the fluid is colored violet.

According to Steadeler, the sediment is warmed with a little H_2SO_4, diluted with water, neutralized with barium carbonate, boiled, filtered, and to the filtrate dilute ferric chloride is added drop by drop.

PLANTA'S — Alkaloid Reagent.—See Mayer's Reagent.

PLUGGE'S—Phenol Test.—On boiling a dilute phenol solution with a solution of mercurous nitrate which contains a trace of nitrous acid, an intense red coloration is produced. At the same time metallic mercury is precipitated and a salicylol odor is developed.

Compare Fresenius' phenol test.

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*From compilations of Dr. Altschul (Phar. Centralhalle).

Plugge's reagent gives also a red coloration with albumen, similar to Millon's reagent.

PLUGGE'S—Reagent for Ammoniac.—30 gm. of caustic soda are dissolved in water; into this 20 gm. of bromine are dropped, cooling well; then water is added to make the volume up to 1 liter. To an aqueous or alcoholic solution of ammoniac, containing a little sodium hydrate, a drop of the reagent is added; an evanescent violet color is produced.

PODWYSSOTZKI'S—Test for Emetin.—Emetin gives a brown color when moistened with a drop of a saturated solution of sodium phospho-wolframate in concentrated sulphuric acid. This brown turns to a blue on addition of hydrochloric acid.

POLLACI'S—Phenol Test.—Phenol gives a brown color with chromic acid mixture.

POSNER'S—Test for Peptone and Albumin in Urine.—A diluted, almost colorless, solution of copper sulphate is carefully poured into a test tube containing a sample of the urine, made alkaline, so as to form a layer on top. Peptones produce in the cold and albumin when heated a violet zone at the line of contact.

Compare Brücke's, Rose's Biuret Test.

POUTET'S—Reagent for Fatty Oils (Elaidin Test).—10 gm. of the oil, 5 gm. of nitric acid (40° B.) and 1 gm. of mercury are mixed in a test tube; the mercury dissolves in about three minutes by continuous shaking, the tube is set aside for twenty minutes, then shaken again for a minute. Various fats show a different deportment as regards their consistency and color after this treatment. Olive and nut oil congeal most rapidly. According to another method 50 cc. of oil are mixed with 12 gm. of mercury and 15 gm. of nitric acid (1.35 sp. gr.), when only olive and almond oils congeal; other oils do not.

PRADINE'S—Test for Foreign Colors in Wine.—The reagent is a saturated solution of ammonia gas in ether. When shaken with wine the foreign colors are taken up by the ether.

PREYER'S—Carbon Monoxide Test.—From 3 to 4 drops of the carbon monoxide blood are warmed with 10 cc. of water and 5 cc. of potassium cyanide (1 : 2) solution at 30° C. for five minutes. Under this treatment the absorption bands of the oxy-hæmoglobin spectrum are replaced by a broad absorption band, while the spectrum of carbon monoxide blood remains unchanged.

PAYER'S—Hydrocyanic Acid Test.—As reagent a very dilute alcoholic solution of guaiac resin is employed which contains a trace of copper sulphate. On holding a rod moistened with the hydrocyanic acid solution over this fluid contained in a dish, blue streaks form through the reagent. On stirring the solution turns a blue color.

PROLLIUS' SOLUTION.—This solution, employed for extracting the alkaloids from cinchona bark, consists of a mixture of 88 parts ether, 8 parts of absolute alcohol and 4 parts of spirits of ammonia.

PURDY'S—Glucose Test Solution.—This consists of 4.15 gm. of copper sulphate, 10 gm. of mannite, 20.4 gm. of potassium hydrate, 300 cc. of aqua ammonia (0.880), 50 gm. of glycerin dissolved in sufficient water to make 1 liter. 25 cc. of this solution are reduced by 0.015 gm. of grape sugar.

PUSCHER'S—Test for Alcohol in Volatile Oils.—A few drops of the volatile oil are distributed over the bottom of a clean test tube, then in the upper part of the tube a small wad of cotton is introduced, over which a little powdered fuchsine is sprinkled. On heating, the alcohol vapors first pass off and rising through the cotton dissolve the fuchsine with a red color.

RAFAELE'S—Modification of Spiegler's Reagent.—See Spiegler's Test.

RASPAIL'S—Test for Albuminoids.—With sugar and sulphuric acid albuminoids give a red solution.

Compare Schultze's Furfurol Test.

REICH'S—Test for Cane Sugar.—Cane sugar solution containing cobalt nitrate gives a violet color on addition of sodium hydrate solution

REICHARDT'S—Test for Arsenic in Urine.—200 cc. of the urine are evaporated with about 2 gm. of caustic soda to dryness, the residue taken up with a little water, acidified with hydrochloric acid and then tested in a Marsh apparatus.

(To be Continued.)

OUR MEDICINAL HERBS AND PLANTS.

BY GEORGE ETHELBERT WALSH.

Forty years ago a New England kitchen garden was not considered complete without a collection of medicinal herbs for home use, such as sage, saffron, chamomile, wormwood and burdock, and all the early almanacs contained information about gathering, drying and preparing these plants for internal and external application. It is so rare to find a garden to-day containing any of these useful plants that the question is often asked if people no longer employ them for medicinal purposes, and if the substitution of chemicals and minerals has not entirely killed the trade in herbs.

No statistics are published by the wholesale druggists to show just how many tons of common medicinal plants are consumed in this country every year; but the best informed dealers agree that twice as many are used today as in earlier times. The only difference is that the good housewife now goes to the drug store for her supply of herbs instead of raising them herself, and great numbers of herb gatherers and professional growers make a business of supplying the wholesale botanical druggists with the various plants. The trade in these medicinal herbs is enormous, and every wholesale botanical druggist must carry between one thousand and one thousand five hundred different plants in stock. The minerals used by the druggists are few compared with the herbs and plants, such as potash, arsenic, alum, sulphur, salt, iron and lime, in their various forms. These are compounded in various ways with the medicinal plants, and constitute the bulk of the medicines dispensed to the public.

The manufacturers of patent medicines use great quantities of plants, but, as they generally confine themselves to the cheap ones, their supplies are made up chiefly of twenty or thirty of the common roots and barks. Some of the large concerns use twenty to thirty tons of these roots and barks a year, and many smaller ones use half that quantity.

Germany, France and Italy send considerable quantities of medicinal plants to this country, but the American growths are considered best, and the leading druggists prefer to handle them alone. The imported horehound, centaury, coltsfoot, daisy flowers, and the roots of burdock and angelica sell at from three to ten cents a pound cheaper than the American products, and patent medicine manufacturers who have to go into the market to purchase their supplies generally take the imported because of the difference in price. The American growths are generally stronger, and cured under better conditions, and are well worth the extra price demanded. The European countries also send us aconite, belladonna, conium, feverfew, foxglove, henbane, marigold flowers, stramonium, sage, wormwood and the balms, but owing to duties on these, the prices are more equalized.

On the other hand, we export considerable quantities of certain medicinal plants to London and other European ports, such as lobelia and hemlock bark, and the extracted medicinal principles of many others. By exporting the alkaloids the bulk is reduced and transportation rates cut in two. The most prominent of these shipped to Europe are podophyllin, leptandrin, sanguinaria, sinecin and euonymin.

Most of the medicinal herbs grow wild in this country, and they are gathered from the woods and fields by professional herb pickers; but a few are regularly cultivated on farms and gardens. Most of the peppermint for distilling oil is grown in New York and Michigan. Sage is raised extensively on farms in Massachusetts, New York and Michigan. Nevertheless, we import over 100 tons of sage every year, and after paying three cents a pound duty it is sold at $80 and $85 per ton. The American sage brings as high as $140 per ton, and yet not more than twenty tons are raised here. Owing to the demand for it here and the inadequacy of the home supply, French and German growers have in late years been sending us a pure and superior article that brings even more than the American product. The cheap imported sage comes chiefly from Italy.

The mountains of North Carolina and Tennessee yield great quantities of medicinal herbs for the trade. Most of them grow wild there, and the pickers make a living in gathering the plants for the market at the proper season. Probably twenty tons of boneset, pennyroyal and thorn apple leaves come from these Southern mountain districts every year, and forty to fifty tons of mandrake, Culver's root, golden seal, garget root, blood root and black cohosh.

Most of the medicinal herbs that grow wild in New England are considered superior to those raised anywhere else. Almost without exception the herbs raised in New England bring $20 to $40 per ton more than those gathered in the Southern or Western States.

Until quite recently the chief supply of saffron came from Vermont, but a severe drought there killed so many of the plants that the price advanced from fifty cents a pound to $6 and $8 per pound. This induced the growers in the West and in Mexico to enter into the cultivation of saffron, and the price dropped at times as low as twenty and fourteen cents a pound. But three times since 1846 the price has run up to $5 per pound.

The common garden wormwood thrives in many old, neglected gardens, and the trade demands considerable quantities of it, but very few make a business of growing it. A good deal of this is distilled for the oil, and is often sold in barrooms under the name of absinthe. Sixty years ago farmers raised most of it in New York and Vermont, but other farm crops crowded out the plant, and the supply comes chiefly from the wild growths in various parts of the country. France and Germany both send wormwood here, which sells about the same as the best American, although some of the imported wormwood is cheaper. Probably five times as much wormwood is imported as our farmers at home raise.

The Pacific coast sends a great many medicinal herbs to the large markets, and patent medicine men who buy their barks and roots generally go direct to the mountains of Tennessee or to the Pacific coast and make annual contracts for the delivery of a certain number of tons. California produces ten or twelve tons of horehound annually, and this, with the amount raised at Cape Cod, enters into competition with the horehound imported from Mexico and Germany.

The medicinal herbs that are in great demand to-day, and which are used twenty times as much as they were in earlier days, make a pretty formidable list. Chief among the roots that have increased in popularity are Culver's root, mandrake, blood root, yellow dock, dandelion, burdock, angelica, bayberry, bitter root or dogsbane, blue flag, elecampane, golden seal, garget or pigeon berry, lady's slipper, pleurisy root, senega or snake root, spikenard, sarsaparilla, unicorn root and jessamine root. The barks of the following trees, shrubs and plants have also become of great value to the medical world, and they have steadily increased in popular favor with druggists and physicians: Prickly ash, barberry, black haws, buckthorn, cascarilla, cherry, cohosh or blacksnake root, cotton root, cramp bark and slippery elm. Of the herbs, the chief ones are: Arnica, belladonna, boneset, catmint, clover blossoms, elder blossoms, fireweed, gold thread, gravel plant, or trailing arbutus or Mayflower, henbane or night shade, horehound, sage, liverwort, squaw vine or partridge berry, pennyroyal, skull cap, balmony, thorn apple leaves, thyme, water pepper or smart weed and wintergreen.

Most of these plants grow wild, and there is little systematic effort to cultivate them, but here and there gardeners attempt to cultivate them in gardens and fields with fair success. Besides these mentioned, there are others that always sell well whether gathered from their wild state or cultivated in the garden. Among these, mention should be made of wormwood, motherwort, lemon and sweet balm, burdock root, comfrey root, yellow dock, hyssop, garden lettuce, marshmallow root, and the leaves of parsley, poppy, stramonium or thorn apple, Jamestown weed and stink weed, valerian, peppermint, spearmint, summer savory and rue.

There are many other herbs and plants which every large wholesale dealer must keep in stock, but which have not increased much in demand. They are only occasionally called for, and the demand is so limited that the wild plants supply the market easily. These are agrimony, angostura, sweet balsam, betony, borage, buck bean, bugle herb, bitter clover, cocash, dittany, haircap moss, lungwort, masterwort, milkweed, mugwort, yellow parilla, sometimes called Texas sarsaparilla, resin weed, scabish, vervain and yarrow.

Of late years ginseng has grown into favor in this country, and the herb gatherers of Tennessee, North Carolina and West Virginia make considerable in gathering it. Ginseng is shipped to China in large quantities, where it is generally accepted as possessing marvelous curative virtues. The trade in it is steady and will continue as long as the Chinese believe in its medicinal virtues. All through the Appalachian region ginseng abounds, and some is found in New Jersey, but the roots are being gathered so freely that the supply will in time run short. Attempts to cultivate ginseng in the South have so far failed, but with the right conditions there is no reason why it should not flourish in gardens or fields. There are probably a quarter of a million pounds of this root exported, and it is sold all the way from fifty cents to several dollars per pound, according to its quality. In China, the best ginseng comes from Manchuria, known as the "imperial," and is sold only to the wealthy, who frequently pay fabulous prices for it. The second grade is collected in Corea, while the ginseng used by the common and poorer classes is gathered in the United States. In China this latter sells from $2 to $5 a pound, while the "imperial" may bring $40, $50 and $100 a pound. The Chinese call ginseng "jen shan," and believe that only the most perfect grows in the Garden of the Gods, and that all else is merely an imitation. This superstition costs the Chinese many thousands of dollars, for, while the root has some medicinal value, it possesses no specially marvelous virtue. (Sci. Amer.)

CONCENTRATED OILS FOR TOOTH WASHES OR PASTE.—Peppermint oil 40 gm., Ceylon cinnamon oil 5 gm., clove oil 20 gm., cassia oil 20 gm., anise oil 35 gm., and vanillin 1.5 gm. To 300 gm. of alcohol or paste 5 gm. of this mixture is added.

GOLD PLATING BY DIPPING.—The Ztschr. f. Angew. Mikrosk. gives the following formula: Crystalized pyrophosphate of sodium 80 gm., hydrocyanic acid (12 per cent.) 8 gm., and crystalized gold chloride 2 gm. are dissolved successively in one liter of distilled water and heated to boiling. The object to be plated is well cleansed, attached to a copper wire and immersed in the boiling fluid.

OXYCYANIDE OF MERCURY.—A white powder, soluble in water, which is useful in 1 or 2 per cent. solution in treatment of acute conjunctivitis; also in that affliction of new-born infants.

THE THERAPEUTICS OF EMERGENCIES.*

BY H. MACNAUGHTON-JONES.

I.—Ethical and Theoretical Considerations.

The lecturer, having briefly referred to the association's work and the present day equipment of the pharmacist, proceeded to say: There can be no greater testimony to your careful training, the education you have received towards developing exactness in your methods and experiments, and the caution with which your manipulative procedures are conducted, than the fact that out of the millions of prescriptions daily dispensed throughout the country it is the rarest thing to have any mistake in manipulation, to find any error of judgment in compounding, or misdirection given as to the use and application of the remedy. I say this from an honest appreciation of what I owe to the pharmacist, in the exactitude and care with which prescriptions demanding fine subdivision of dangerous remedies, and their perfect combination, are dispensed. Nor am I the less appreciative from the fact that several years of my early life were spent in the acquisition of that same method of compounding, the drudgery of which apprenticeship I have never had any reason to regret. I only refer to those traits which the calling of the pharmacist is specially calculated to develop, in order to urge that the very qualities which are essential to make you good pharmacists are also those which are most likely to find you ready in the emergency of sudden accident or illness, calm and resourceful in the face of unexpected difficulty, and which are at the same time preventive of rash meddling and fussy interference.

There are a few things which I wish to say with regard to the title of the subject matter of this lecture. It is all very well as long as one glides along on good solid ice, keeping a safe and reasonable distance from treacherous water. Only the foolhardy run the risk of immersion by encroaching upon the thin crust of interdicted area. So it is with regard to certain vexed questions; the wise and prudent avoid them. Still, it must frequently happen that advance in any direction, whether it be in science or in art, in a calling or an exercise of athletic skill, is only to be acquired by an exhibition of that very foolhardiness and rashness which the more cautious avoid and condemn.

Incidentally let me ask, is it not well occasionally to remember and recognize the fact that "rashness," even to the point of foolhardiness, and sometimes beyond this, has been the quality of all others to which the progress of the human race, of civilization, and of our own empire, owe the most? That is, that rashness and daring, combined with audacity, which the world generally counts as such, a rashness in which all considerations of self and self-interest are forgotten, and only the enthusiasm—fatalism and fanaticism, if you will—of the devotee remains.

But such thoughts would entice us widely apart from the subject we are considering. Indeed, touching on recent events, they would carry us with the Fram to the North Pole; with a few unarmed Englishmen to the impi entrenchment of the Matabele; and take us, not without some sad reflections, somewhere near the sources of the Nile. While, on the other hand, speaking of medical occurrences, they would bear us back to such acts as that of the Boston dentist, Horace Wells, which directly led to the application of anaesthesia; to the bold innovation of the Kentucky surgeon, Benjamin MacDowell, which led up to our modern abdominal surgery in women; and, referring to more strictly scientific and social gains, to Franklin and his kite, and Stephenson and the "coo."

To return to my subject, let me at once state that, using the term in its ordinary sense, I do not approve of pharmacists prescribing. It is incontrovertible that there must be elements of danger, at times of considerable danger, attached to such prescribing, no matter how simple such prescriptions may be. A dose of Epsom salts, given in certain conditions, may indirectly lead to the death of a patient; but then, on the other hand, the same may be said of a mutton chop. As Sir Thomas Watson pointed out, it all depends upon the circumstances in which the Epsom salts or chop is given. To induce diarrhœa in a person sickening for typhoid fever may have disastrous consequences, while to give prematurely a mutton chop to the same patient in a condition of convalescence may be equally dangerous. Nor can we get out of the difficulty by assuming that the advised remedy is harmless. The negative results of such action may be as hurtful as those positive consequences I have just referred to. Delay in doing the right thing is often as serious to the patient as indiscreet haste. More deplorable still is that ignorance which prompts the administration at the wrong time, or under contra-indicating circumstances, of some unsuitable drug. And it must be always borne in mind that some of the most fatal of acute diseases are ushered in by the sudden appearance of symptoms which may not in themselves appear to be serious, and which can be closely simulated by those that are of everyday occurrence in the case of transient affections of comparatively little moment. Even of still greater importance is the fact that it is just in this class of affections that a false step can never be retraced, and that any delay in the application of the right remedy may be fatal.

I see no excuse whatever, either as a matter of expediency or in the light of philanthropy, for that class of prescribing which affords a pretext to mean and penurious people of obtaining quasi-medical advice by buying a bottle of physic or patent medicine over the counter. It is, as a rule, a shabby method of evading the necessity of paying the doctor, and if successful defrauds a hard-worked professional man of that which should by right find its way into his pocket. Be it remembered, too, that the poor and impecunious are not the greatest sinners in this respect. The wealthy stock broker, and the wife of the rich city merchant are common offenders, and they are just the persons that the pharmacist has greatest difficulty in refusing.

Nothing is harder for the chemist's assistant than to evade the cross fire of "my lady's" or "Mr. Mida's" questions as to what is good for this or that condition, or under what circumstances such and such a patent-medicine may be taken. Nay, I confess that it is well nigh impossible, and contrary to all his interests, to expect him to do so. The question is a wide one, involves many issues and interests, and has to be viewed from a broad and liberal standpoint, for in it the public, as well as the pharmacist and doctor, are interested. I maintain that the medical profession, in its present struggle for existence, amidst gross and unblushing hospital abuses, cheap so-called philanthropic enterprises, public dispensaries, clubs, friendly and benevolent societies, and all the other avenues by means of which ways are found to deprive the struggling practitioner of his livelihood, is now more than ever justified in regarding with a jealous eye any further inroads that threaten to cripple its resources and imperil its ethical relations to the public. At the same time—of this be sure—the medical profession as a body will never allow any such selfish interests to stand between its sense of what is right, and the duty it owes to the State and the public.

I quite admit that it is well-nigh impossible to draw the line, and say where the privilege and duty of the pharmacist cease, beyond which his liberty of action must be curtailed. I admit, further, that the whole tendency of modern thought, despite trades unionism and caucuses, is in the direction of individual freedom of action. The liberty to do that which is right must ultimately prevail, no matter how vigorous may be the attempt, however well meaning, to curtail and imperil the right of such independent action, the motive springs of which are transparently pure and right.

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*Abstract in Chem. and Drug. of a lecture to the Chemists' Assistants' Association (London), February 18.

What would be said of the man casually left in charge of the Humane Society's appliances, who hesitated to save a life because the authorized servant of the society was absent? What should we say of the railway subordinate who, in the accidental absence or sudden illness of the signalman, hesitated to turn the points, in view of an approaching collision? And what would be said of a pharmacist's assistant who waited for the coming of the doctor, in the face of a recent suicidal act of poisoning, to administer the antidote which he had ready to hand?

It is, then, not a question whether any such right of action serves, or is contrary to, this or that interest. It resolves itself simply into the higher and wider issue of the best interests of the State and the public, and the inherent right and duty of every individual to serve these. To what end have we public lectures on health, ambulance courses, popular works on health by distinguished physicians, and popular journals on health and disease, written for the railway bookstall? Are not all these cheap methods of educating the people how to doctor themselves without the aid of either pharmacist or physician?

This they are, thanks to all these means, always doing, and in daily increasing numbers, since the competition in educating and training amateur doctors, both male and female, has become so great.

So far as my present object is concerned, I wish it to be clearly understood that I am discussing only those instances of absolute emergency, where there is no immediate medical assistance at hand, and where the delay necessary in procuring it may be fraught with serious consequences to the sick or injured person. I have deliberately chosen the title of "The Therapeutics of Emergencies," in order to point out certain conditions under which the pharmacist is justified in affording aid to a person who is taken suddenly ill or is accidentally injured. I am not dealing with the giving of prescriptions for ordinary ailments. How far it will ever be possible to prevent or restrain what is called "counter prescribing" it is not my place to inquire. I fear that the "pick-me-up" of the early morning man-about-town, the "comforting cordial" of the phlegmatic woman, the "liver tonic" of the irritable dyspeptic, the "dinner pill" of the over-eating gourmand, the "worm powder" for the puling child, the liniment for the "backache," and a thousand and one patent combinations, with their widely advertised "miraculous" effects, will ever be had and recommended for the asking. On the other hand, I maintain that it is no part of the pharmacist's work to usurp the prerogative of the medical practitioner, and gradually turn the chemist's shop into a consulting room or surgery.

And there is another strong point with regard to this question, and that is the correlative trust and sympathy that should exist between this great outpost of medicine and medicine itself. Pharmacy has ever been, and always must be, the active commissariat in the advance of medical science. By and through your calling we carry the attack into the enemy's country. You furnish our transports, you are always in our van, and ever adapting yourselves to the difficulties which beset our invading columns. Therefore it is that each should look mutually to the other for loyal support and an inviolable offensive and defensive alliance. The interests of both are best served by such a cordial understanding, and anything that tends to weaken it, or to create distrust, jealousy, or angry feeling on either side, is greatly to be deprecated by both.

(To be continued.)

ARTHRITICIN.—A new disinfectant, which appears in tablets weighing 0.25 gm. each; chemically it is a mono-hydro-phenol - æthyl - diethylene - diamine - amido-aceto-nitril. The tablets are soluble only in hot water. It burns with a smoky flame, leaving a slight ash. It has only slight bactericidal powers.

Higher Education for the Pharmacist and Physician.

BY JOHN F. PATTON, YORK, PA.

I am always an interested and sometimes an amused reader of the articles, editorial and communicated, appearing from time to time in the columns of the Era. What an agony of mind and perturbation of spirit is manifested by the writers in discussing the department store, the cutter, the advance in the price of nostrums, the prescribing pharmacist, the dispensing physician, window dressing, the most effective mode of sensational advertising, etc. Is legitimate pharmacy to stand or fall by any of these things?

As to the commercial side of pharmacy, is it reasonable to expect that the immutable laws of trade will be set aside at the behest of any one interest? The price of commodities and the value of service always have been, and always will be, fixed by the law of supply and demand, and the superior will always take precedence of the inferior. Hence the fallacy of organization in the interest of material prosperity. Prosperity does not come to the individual by organized effort or legislative enactment. It is a matter for each individual to work out in his own way, influenced only by his environments.

The present condition of pharmacy is that of congestion. There are too many in it; we have quantity rather than quality, and there is but little satisfaction in a knowledge of the fact that the profession of medicine is in like condition. Doctors and drug stores have increased way beyond the needs of the people. In these days of such keen competition, there is inspiration in the thought that the fittest will survive. This declaration of Darwin is exemplified in the position the fittest pharmacist now holds in every community. Did the average individual in the drug business give half as much thought to the question how to become a better pharmacist as he now gives to the above subject, the people he serves, and the physician he aids, would be greatly his debtor, besides his own interest, peace of mind and comfort would be greatly enhanced.

The past few years have witnessed great depression in all branches of trade. The hard times have been most keenly felt by the small dealer, for the trend of sentiment and the popular prejudices seem to run in the direction of concentration. In other words, the large dealer has had the call. Is this condition to go on until we witness the passing of the small drug store? It looks very much like it. An important factor to this end is the fact that the medical men are no longer making use of the U. S. Pharmacopœia and National Formulary, either through ignorance of their existence or a contempt for their authority. The literature of the manufacturer seems to have almost supplanted these text books. This is a decided change, but is it progress? What will the harvest be? The saving hope is in those physicians who have had a pharmaceutical education, and when this is made a condition by our medical colleges we may hope to see true progress made in the science of medicine on the basis of a higher education and its practice along the line of constituted authority.

NEW EXPLOSIVES.—The higher fatty acids (as stearic and palmitic acids) have the peculiarity of forming explosive combinations with ammonium nitrate, particularly when metallic salts or soaps of the fatty acids are used. When 6 per cent. of a calcium soap is mixed with 94 per cent. of ammonium nitrate, a mixture is obtained which can be exploded with great force by means of a fulminate of mercury cap.

——At the February meeting of the Maine Commission of Pharmacy, a certificate as qualified assistant was granted to Charles A. Trayton, Sanford.

John H. Piercy, head of the drug firm of Piercy & Co., Greencastle, Ind., died March 3, after a lingering illness. Mr. Piercy was for two terms Deputy Auditor of Indiana.

PHARMACY.

SAPONIN EMULSIONS.—The Revue Pharmacie de Flandres offers the following formulæ for saponin emulsions:

Castor oil, 30 parts; saponin, 0.15 part; water, 150 parts.

Cod liver oil, 100 parts; saponin, 0.20 part; peppermint water, 100 parts.

Balsam copaiba, 5 parts; saponin, 0.12 part; water, 95 parts.

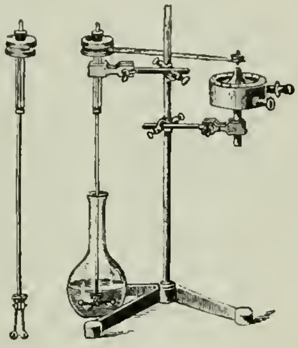
Creosote, 1.25 parts; sweet oil of almonds, 10 parts; saponin, 0.06 part; water, 100 parts.

Iodoform, 2 parts; sweet oil of almonds, 8 parts; saponin, 0.18 part; water, 100 parts.

Chloroform, 0.5 part; sweet oil of almonds, 15 parts; saponin, 0.12 part; water, 100 parts.

Camphor, 0.8 part; sweet oil of almonds, 15 parts; saponin, 0.12 part; water; 100 parts.

NEW STIRRING APPARATUS. — The only new point about this apparatus is that at the lower tip of the stirring rod two somewhat heavy glass stoppers are attached, hinge fashion, by means of a small rod of platinum; when the rod is revolved with force the stoppers swing about horizontally and secure a thorough mixture of the fluid.



QUALITATIVE AND QUANTITATIVE SEPARATION OF SODIUM AND POTASSIUM.—Kreider (Zeitschr. Anorg. Chem.) carries out the separation of these two alkalies in that he treats the mixture of the perchlorates with 97 per cent alcohol, in which solvent the potassium salt is insoluble, and the sodium salt readily soluble. The sodium salt is then removed from the alcoholic solution by passing dry hydrochloric acid through it while kept cold. The presence of 0.00006 gm. of Na_2O can be readily detected; if 0.0005 gm. is present a granular precipitate is obtained. In the usual course of analysis, after all of the other elements have been removed, the solution is evaporated to dryness, ignited, dissolved in water, filtered and the solution is again heated on a water bath with 0.1 to 0.5 cc. of pure perchloric acid of specific gravity 1.70, until the white vapors of perchloric acid are visible. If larger quantities of sodium are present the evaporation is repeated.

ESTIMATION OF CAFFEINE IN TEA.—Dr. Keller has devised a method which differs materially from those that have thus far been proposed. In a wide-mouthed separating funnel 6 gm. of dried whole tea leaves are introduced with 120 gm. of chloroform; after a few minutes 6 cc. of aqua ammonia are introduced, and the mixture is well shaken. The leaves swell up and the caffeine is taken up by the chloroform. The mixture is allowed to stand for three to six hours till clear, when 100 gm. of the chloroform, representing 5 gm. of the tea, are drawn off, filtering through a small filter (wetted with chloroform) into a small flask. The chloroform is distilled off and the residue is covered with 3 to 4 cc. of absolute alcohol, which is allowed to evaporate while heated on a water bath. The crude caffeine is purified by dissolving in a mixture of 7 cc. of water and 3 cc. of alcohol; after solution has taken place, 20 cc. of water are added, the flask corked and the contents well shaken, which causes the chlorophyl to ball up, enabling the operator to afterward remove it by filtering through a small wetted filter. After rinsing the flask and filter, the filtrate is evaporated to dryness and weighed. The weight of the residue, multiplied by 20, gives the percentage of caffeine in the sample.

ESTIMATION OF BORIC ACID IN GAUZE AND COTTON.—Beckurts and Danert (Apoth. Ztg.) have devised the following method of assay for borated gauzes and cotton: As solvent, a mixture of water and glycerine in the proportions of 20 to 1 was found best. Of the borated cotton or finely cut gauze, 5 gm. are shaken with about 400 cc. of a mixture of 1 part of glycerin and 19 parts of water, employing a flask of 500 cc. capacity. From this fluid 100 cc. are drawn off and titrated with a $\frac{N}{10}$ normal sodium hydrate solution with addition of glycerin and employment of phenol phtalein as indicator. The number of cubic centimeters of $\frac{N}{10}$ normal sodium hydrate solution employed when multiplied with 0.0062, gives the total quantity of boric acid contained in 5 gm. of material; this multiplied by 100 gives the percentage composition.

A sample gauze labeled 10 per cent. boric acid gave the following results:

100 cc. of the solution required—

	Glycerin.	N—10. Sodium Hydrate.	Boric Acid.
1. Upon addition of...	28 cc.	13.4 cc.	= 8.03%
2. " " "	30 "	12.8 "	= 7.94%
3. " " "	26 "	12.9 "	= 7.99%
4. " " "	38 "	12.5 "	= 7.75%
5. " " "	34 "	12.4 "	= 7.69%
6. " " "	40 "	12.4 "	= 7.68%

Direct titration of boric acid by means of normal alkali hydrates, with the usual indicators is not practicable because before all of the boric acid is fully neutralized the indicators change color, due probably to the fact that boric acid in aqueous solution does not deport itself to indicators as an acid. However, it has been found that in the presence of glycerin, with phenol-phtalein as indicator, it responds readily to a $\frac{N}{10}$ solution of sodium hydrate. The quantity of glycerin necessary is noted during the titration; if the indicator shows an alkaline reaction, a little more is added, which will cause the solution to turn acid again, this being repeated until no further change is observed upon the further addition of glycerin. The reaction is as follows:

$$B_2O_3 + 2NaOH = 2NaBO_2 + H_2O.$$

The standard sodium hydrate solution must be absolutely free from carbonated alkali.

PILL MACHINE.—Messrs. Franke & Co., of Liepzig, have patented a pill machine adapted to handling large quantities. The mass is made in machine No. 2; at one end of this is placed perforations of various sizes, through any one of which the mass is forced, yielding a uniform pipe. This pipe is then laid along between the two screw threads of machine No. 1. On rotating, the screws the pipe is grasped, cut and rounded off into pills, which fall out below.

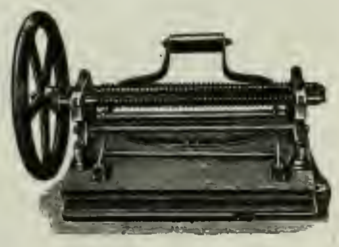


Fig. 1.

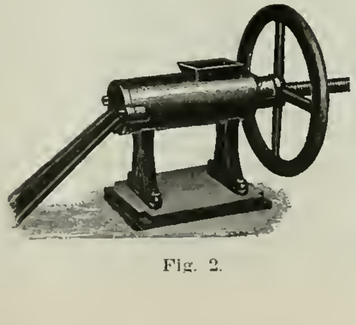


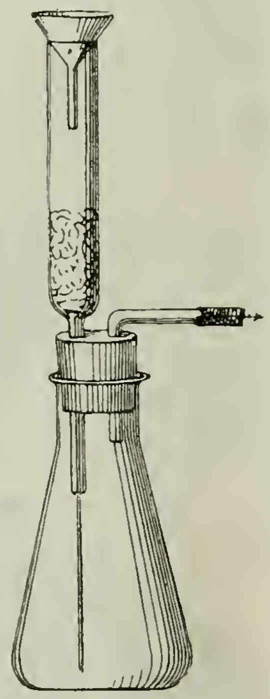
Fig. 2.

PURIFICATION OF SEWAGE BY ELECTRICITY.—J. Koenig and Remelé have studied the various methods proposed for the purification of water by the electric current, more attention being given to the method of Webster, which consists in subjecting the water containing alkali chlorides naturally, or these having been added, to the action of the electric current, iron plates being employed as electrodes. Through the action of the electric current the chlorides are split up into their iones, chlorine and the respective metal. The chlorine, which collects at the anode, takes up a portion of the iron as ferrous chloride, the metalloid (iron) reacts with the water, resulting in liberation of hydrogen and formation of the alkali hydrate which at once decomposes the ferrous chloride, yielding ferrous hydroxide and the alkali chloride. The ferrous hydroxide soon goes over into ferric hydroxide from exposure to the air.

This method of purification was found to be more thorough than the older single precipitation method with ferrous sulfate and lime, because of the constant recurring formation of ferrous hydrate which securely enclosed and carried down the particles of suspended matter. Also in the older method it was necessary to employ a slight excess of alkali in order to facilitate precipitation; this free alkali, however, exerts a solvent influence upon the precipitated organic material, which is not the case in the electrolytic process. Waters purified by the electrolytic method cannot be considered in as favorable a light as those purified by the iron and lime process, from a bacteriological standpoint as regards the number of bacterial spores.

The electrolytic process is best adapted to waters of neutral reaction; an acid or alkaline character influences the precipitation of the ferrous hydrate.

A direct oxidation of the organic matter does not take place, the process of purification is simply chemical, induced by the electrical current; during the entire operation the water remains neutral, which is certainly an advantage. These authors conclude that the electric process of purification is only applicable in those instances where the better processes of purification cannot be used and electric power is cheap.



FOR THE SEPARATION OF EMULSIONS, which so frequently form in the extraction of alkaloidal fluids by means of ether or chloroform, Charles Platt offers the device shown in the figure. The filter tube consists of a tube about 12.5 cm. long and 14 mm. in diameter, narrowed down to a tube of 3 mm. diameter. In the neck of this filter is placed a platinum wire which has been bent at right angles at its tip to prevent the absorbent cotton filter from being drawn through. The tube is filled with ether-washed absorbent cotton to the height of 4 cm., firmly packed; then the apparatus is connected with a filter pump and the emulsion is poured into the tube. According to the author, the most troublesome emulsions can be separated.

BROMOSIN.—According to Paulmann, this is a compound of bromine and albumen, which contains 10 per cent. of bromine.

QUESTION BOX

The object of this department is to furnish our subscribers with reliable and tried formulas and to discuss questions relating to practical pharmacy, prescription work, dispensing difficulties, etc.
Requests for information are not acknowledged by mail and ANONYMOUS COMMUNICATIONS RECEIVE NO ATTENTION.

Formulas Wanted.

(A. C. C.) wants a formula for a preparation to recoat bicycle tires and give them the appearance of being new.

Tan Shoe Polish.

(R. E. M.) See this journal, Feb. 18, 1897, page 207.

Remedies for Venereal Diseases.

(J. K.) We do not give formulas of this character. The treatment of these diseases belongs to the physician, not to the pharmacist.

Pills of Silver Nitrate.

(H. M.) asks how he shall make pills of silver nitrate with resin cerate. Use kaolin or powdered talcum (a small quantity) and make into a mass with resin cerate. Petrolatum may be used instead of resin cerate. The finished pills may be rolled in powdered talcum.

Interstate and "Diploma" Registration.

(C. H. B.) The March 11, 1897, issue of this journal, page 303, contained a reply to a similar query. By substituting the name of the Pennsylvania Board of Pharmacy for the New York State Board of Pharmacy in the reference cited, you have our best information upon the questions you ask.

Marking Prices on Rubber Combs.

(C. P. H.) Scratch the price in small figures or letters on the back on side of the comb with some sharp-pointed instrument, preferably a darning needle. A white ink may be made for the purpose by suspending a sufficient quantity of zinc white or other pigment in a mixture of dextrine 30 parts, glue 10 parts, water 60 parts (or a sufficient quantity).

Oil to Drive Away Gnats.

(McA. & W.) (1) Take equal quantities of beef's gall, spirit of camphor, fluid extract of gentian, and alcohol.

(2) A solution of beef's gall in spirit of camphor and spirits of turpentine.

(3) Oil of cedar	1 ounce
Oil of tar	1 ounce
Spirit of camphor	2 ounces
Oil of turpentine	12 ounces

Tincture of Iron and Phosphoric Acid.

(C. P. S.) We see no reason why it should take 3 to 5 hours to dispense:

Solution of strychnine	3 drams
Dilute phosphoric acid	6 drams
Tincture chloride of iron	1 ounce
Water, enough to make	4 ounces

Teaspoonful in water after meals.

Of course, dilute phosphoric acid and tincture of chloride of iron are incompatible, phosphate of iron being formed. This salt is, however, soluble in an excess of phosphoric or hydrochloric acid, making a colorless solution. Each dose of the finished mixture will contain 3-64 grain of strychnine, not an excessive dose.

Ink Developed by Application of Heat.

(H. H. A.) We know of no strictly "white" ink which becomes black by the application of heat. However, there are inks with which characters written on paper are invisible, but become black upon heating. Solution of nitrate of mercury will answer for an ink of this character. Lehner (Manufacture of Ink) gives this formula: Heat a cold saturated solution of oxalic acid to boiling and add molybdic acid until no more is dissolved.

Keep the fluid in black bottles. Writing executed with this colorless fluid becomes dark blue when exposed to the sun and black on heating.

A number of formulas for "sympathetic" inks appeared in this journal, June 27, 1895, page 813.

Tincture of Tannin.

(F. A. G.) Hager gives the following formulas under "Tincture Tannica:"

(1)	Tannic acid	30 grams
	Distilled water	200 grams
	Alcohol	100 grams
	Mix and add	
	Lemon peel	2 grams
	Macerate for two days and filter.	
(2)	Tincture of galls,	
	Tincture of catechu, of each	40 grams
	Spirit of rose	20 grams
(3)	Tannic acid	2 parts
	Sugar	1 part
	Dissolve in	
	Distilled water	3 parts
	Alcohol	5 parts

Allow to stand a short time and filter.

Fowler's Solution and Aromatic Spirits of Ammonia with Extracts and Tinctures.

(G. W. S.) The statement in this journal, Jan. 14, 1897, page 41 ("An Obscure Prescription"), viz., "The wisdom of combining Fowler's solution and aromatic spirit of ammonia in prescriptions of this character is not apparent," was prompted by the fact that both of these preparations are decomposed in solutions containing organic substances, more particularly vegetable astringents. We do know that Fowler's solution is frequently combined in mixtures of this kind, but it is a question whether the full therapeutic value of the solution, when so combined, is obtained. Both Fowler's solution and aromatic spirit of ammonia precipitate most fluid extracts, decoctions, tinctures, etc.

"Carbolic Soda."

(F. A. G.) By this title is probably meant the solution of sodium carbolate, or "phenol sodique" of the National Formulary (revised edition, No. 243), whose formula is based upon that of the German Pharmacopœia (I., 1872). There is also a sodium salt of carbolic acid, or sodium phenate, NaC_6H_5O, which is obtained in large quantities by dissolving the calculated quantity of carbolic acid in strong caustic soda, an excess of carbolic acid being avoided, as otherwise a dark-colored product is obtained. On evaporating the solution to dryness, and continually stirring the heated residue, the whole falls to a dry powder. Sodium phenate is very hygroscopic and must, therefore, be placed while hot in an air-tight vessel (Roscoe). This salt is employed in the manufacture of salicylic acid.

Brown Hair Dyes.

(W. H. S. & H. J. G. S.) The Era Formulary gives the following:

(1) Dissolve 8 parts pyrogallic acid in 16 parts of alcohol and mix with a solution of 1 part of sulphide of sodium in 48 parts of water.

(2)	Lead acetate	2 drams
	Sodium hyposulphite	1 ounce
	Rose water	14 ounces
	Glycerine	2 ounces

Dissolve the lead acetate and sodium hyposulphite in separate portions of the rose water, filter separately, mix the solutions, and add the glycerine.

(3).—Chestnut Brown Hair Dye.

Pyrogallic acid	1 dram
Chloride of copper	2 drams
Nitric acid	5 drops
Distilled water	6 ounces

Make a solution.

Preserving Lemon Juice.

(C. P. S.) Various means have been resorted to for the preservation of lemon juice, but none of them seems to make it retain its original flavor unaltered. As preservatives, alcohol, salicylic acid, bisulphite of lime, formaldehyde, etc., have been recommended. Probably as satisfactory a method as any is to clarify the liquid by heating it with a small quantity of albumen in a suitable vessel, without stirring, to near the boiling point of water, until the impurities have coagulated and either risen to the top or sunk to the bottom. It may be then filtered through a twill cloth filter containing some filtering powder, into clean bottles, which should be completely filled and closed (with pointed corks), so that each cork has to displace a portion of the liquid in order to be inserted. The bottles are sealed and kept at an even temperature (in a cellar).

Erasive Soap.

(C. R. S.) Try one of the following from the Era Formulary:

(1)	White soap	12 ounces
	Borax	1 ounce
	Salts of tartar	1 dram
	Oil of sassafras	1 dram
	Water	8 ounces

Cut the soap in shavings and dissolve in the water by the heat of a water bath, add the borax and salts of tartar and boil till reduced to 1 pound; then, while cooling, add the oil of sassafras, and make into cakes of about two ounces.

(2)	Fuller's earth	15 parts
	French chalk	½ part
	Yellow soap	10 parts
	Pearl ash	8 parts

Mix thoroughly, and make into a paste with spirits of turpentine. Color if desired. Form into cakes. A little of this detergent is scraped off with a knife and made into a paste with water and applied to the clothing.

Compound Syrup of White Pine.

(C. T. L.) Here is a formula containing the fluid extracts and other ingredients you name:

Fluid extract white pine bark	1 fl. ounce
Fluid extract wild cherry	1 fl. ounce
Fluid extract blood root	56 minims
Fluid extract spikenard	64 minims
Fluid extract balm of gilead buds	64 minims
Fluid extract sassafras bark	32 minims
Morphine sulphate	3 grains
Chloroform	64 minims
Purified talcum	2 drams
Sugar	10 troy ounces
Water, enough to make	16 fl. ounces

Mix the fluid extracts with about six ounces of water and the purified talcum, and stir or agitate the mixture frequently and thoroughly during about fifteen or twenty minutes. Transfer it to a wetted filter, and, when the liquid ceases to drop from the funnel, wash the contents of the filter with water until eight ounces of filtrate have been obtained. In this dissolve the sugar and morphine sulphate by agitation, and add enough water, previously passed through the filter, to make, with the chloroform when added to the syrup, sixteen fluid ounces. Lastly add the chloroform and shake thoroughly.

A similar formula under the title "Expectorant Syrup of White Pine," appeared in this journal last week, page 363. See also "Compound Syrup of White Pine," National Formulary.

Potassium Permanganate as an Antidote in Morphine Poisoning.

(P. A. D.) We cannot name with any positive degree of certainty the discoverer of the treatment of morphine poisoning by potassium permanganate, but it was during the early part of 1894, we think, that a certain Dr. William Moor, of this city, gained considerable notoriety by swallowing a poisonous dose of morphine, following it immediately with a solution of potassium permanganate as an antidote. As he experienced no ill effects his exploits were heralded far and wide by the newspapers of the country, many of which proclaimed him as a great benefactor of the human race. The medical and pharmaceutical journals of that year are filled with many articles showing the interest the doctor's experiments and statements excited. Dr. Moor claimed that potassium permanganate exercised a selective power for morphine in the stomach, and it would decompose a morphine salt several hundred times quicker than it will decompose albumen. His treatment was, therefore, the administration of several grains of permanganate of potassium in water as soon as possible after the toxic dose of morphine had been taken. Many of the medical profession failed to accept the efficacy of potassium permanganate as an antidote to morphine, although there were not a few laudatory papers in the medical journals upon the subject. Treatment by hypodermic injection (¼ to 1 grain) was recommended by some, but the results were far from uniform. Dr. H. C. Wood, of Philadelphia, after having very carefully investigated the subject, reported in the University Medical Magazine as follows:

"It seems to me that the evidence which has been offered by Dr. Moor and others, taken in conjunction with what I have been able to bring forward, indicates that the potassium permanganate given by the mouth directly after poisoning is a valuable, but not perfect, antidote to the morphine salts—an antidote, however, which should not be relied upon to the exclusion of emptying the stomach by medicinal or mechanical means.

"I do not know that it has been claimed in type by any American observer that the potassium permanganate is capable of following an organic poison into the blood and there acting upon it, although I was recently surprised to find in New York City the widespread belief in the existence of such actions, so that tablets of the potassium permanganate are furnished for hypodermic use. Further, Schlagdenhauffen and Reeb distinctly claim that the permanganate has the power of being absorbed and acting upon the poison which has been previously taken into the blood. The avidity with which potassium permanganate attacks all kinds of organic matters, living or dead, strongly militates against its capability of absorption into the blood, and I have always believed that such absorption was impossible. At present both a priori reasoning and experimental evidence make it highly improbable that the permanganate has any influence upon a poison after its absorption."

If you wish to investigate this subject in detail we suggest you consult the files of some good medical journal published during 1894. Considerable information was also published in volumes XI. and XII. of this journal. Consult the indexes.

Precipitation in Solution of Citrate of Magnesium.

(W. C. C.) The crystalline precipitate you have noticed in solution of citrate of magnesium is normal magnesium citrate, $Mg_3(C_6H_5O_7)_2$. As you are probably aware, magnesium carbonate and citric acid are capable of forming both normal and acid citrate, the particular reaction depending upon the proportions of acid and base employed. The normal citrate is but slightly soluble in water and crystallizes from its solutions with 14 molecules, or about 36 per cent. of water. It is formed whenever 1 part of magnesium carbonate and 1.44 parts of citric acid are brought together. Upon the other hand, acid magnesium citrate, $MgHC_6H_6O_7$, requires 2.16 parts of citric acid for each part of magnesium carbonate used. It is very soluble.

Caspari says, by following the official formula, a mixture of normal and acid magnesium citrate is produced, as insufficient citric acid is used to form the latter salt alone. Since 2.5 grams of potassium bicarbonate require about 1.75 grams of citric acid for complete decomposition, and only 0.6 gram is furnished by the 60 cc. of syrup of citric acid ordered, there will be still less magnesium citrate in the finished product, and the tendency to deposit the normal salt will be increased. The first edition of the 1890 Pharmacopœia directed 120 cc. of syrup of citric acid, but this was changed afterwards, as the solution was found too sweet, containing about 100 grams of sugar in every bottle. For extemporaneous preparation of solution of magnesium citrate, the pharmacopœial formula answers admirably, and the citric acid may even be reduced to 25 grams, with advantages as regards the taste; but if the solution is to be kept in bottles, for possibly a week or two, or even longer, a more acid solution should be prepared, using 33.58 grams of citric acid in place of 30 grams, as officially directed.

Another source of trouble is the use of plain water, which sometimes causes fungi to form and renders the solution unsightly; this can be obviated by boiling and filtering all the water to be used. Sound, soft corks only should be used for closing the bottles, and, having been first swelled in water for an hour, they should be driven firmly into the neck of the bottle and then secured with twine or wire, as retention in the solution of all the carbon dioxide, from the potassium bicarbonate, adds materially to the refreshing taste. The bottles should be kept in a cool place, resting on their sides.

The following modification of the pharmacopœial method has also been recommended: Following the pharmacopœial method, replace the bulky magnesium carbonate by one-half of the quantity of Jenning's light calcined magnesia. The syrup of citric acid should be introduced into the bottle, and the filtered solution of magnesium citrate very carefully poured in without stirring up the syrup. The potassium bicarbonate, in large crystals, is dropped into the bottle—they gradually dissolve in the syrup of citric acid—and the cork is at once inserted to prevent the loss of carbonic acid gas. The bottle is not disturbed till it is called for, when a vigorous shake mixes the solution of the bicarbonate in the bottom of the bottle with the acid of the liquid above, liberating the carbonic acid gas, and the solution can then always be dispensed in a sparkling condition.

Another formula which has the indorsement of the A. Ph. A. Committee on Revision of the U. S. Pharmacopœia may be found in this journal May 21, 1896, page 650.

ACETOCAUSTIN.—A 5 per cent. solution of tri-chloracetic acid.

CHELIDONIN.—The various salts of this alkaloid from the Chelidonium majus have been recommended as a mild narcotic in place of morphine or opium for children. Dose, 0.05 to 0.2 gm.

COMPOSITION OF ATMOSPHERIC AIR.—The latest investigations of A. Leduc give the following results: Oxygen, 21 volumes (23.2 parts by weight); nitrogen, 78.06 volumes (75.5 parts by weight); argon, 0.94 volumes (1.3 parts by weight).

ANTIBACTERIN.—According to Wachter this constitutes a yellowish-green solution containing orthoboric ethyl ester with traces of iron. This solution is readily decomposed on contact with water, and is intended as a bactericide to be inhaled in treatment of consumption.

CORONILLIN.—A glucoside from the seed of the Coronilla scorpioides. It form a pale yellow powder, of very bitter taste, slightly soluble in water. The physiological action of coronillin is stated to be similar to that of digitalin. It exerts a decided tonic effect upon the heart, with diuresis.

——A Retail Druggists' Association will probably be formed among druggists of Helena, Mont., at an early date. It has been talked about informally for some weeks past, and from the expressions of opinion obtained it appears that practical unanimity of sentiment in its favor prevails. At an early date a call is to be issued for a meeting to discuss the matter and take some action. The purpose of the association will be to maintain prices and prevent cutting.

THE PHARMACEUTICAL ERA

[*WEEKLY.*]

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Good Faith and Cutting.

For a long time past the druggists of Erie, Pa., have been doing business for fun, so far at least as the patent medicine trade is concerned. Cutting on these goods had progressed to the point that they were being sold at less than cost, and much bitter feeling between the druggists had been engendered. But now they have decided to quit their foolishness and get back again on a common sense basis. They have effected an organization with the primary purpose of raising the prices of patent medicines to the old figures at which they paid a profit. In their agreement is a "good faith" feature which is expected to hold them together. Each member contributes a bond of $50, as an individual guarantee of good behavior, which bond is to be forfeited to some charitable institution if the agreement is broken. Fifty dollars is a good big sum nowadays, and represents the profit on a good many sales; it is reasonable that the members will hesitate long before letting such a sum get away. But in case any one does "backslide," the others are at liberty to join in the cut rate war thus surely inaugurated, but they don't get their money back, as all the bonded guarantees in such an event will be turned over to a charitable institution. It will be interesting to watch the result of this union, to see how long the threatened loss of fifty dollars will act as a "restrainer" from throat cutting.

Pharmaceutical Progress.

How many of us realize that it is during only the past thirty years or even less that pharmaceutical knowledge and art have made their wonderful progress, that before that time all was empiricism in both chemistry and pharmacy, and that what are now everyday necessities were then curiosities of nothing but passing interest. Mr. William Martindale, in an address last year to the British Pharmaceutical Conference, made these facts emphatically clear. Thirty years ago he for the first time had an opportunity "of seeing and testing the physiological effects of what was then little more than a curiosity, namely, amyl nitrite. We now have quite a cluster of these nitrogen compounds used as arterial dilators—isobutyl nitrite, sodium nitrite, nitro-glycerine, hydroxylamine, and more recently erythrol nitrate."

We have mistakenly believed that certain drugs are old, have been long known, but we find that the greater share of modern medicaments are of very recent introduction, for, says Mr. Martindale, chloral hydrate was first exhibited at the meeting of the B. P. C. in 1869. "Boric acid was but a chemical rarity previous to 1875; it is now produced in tons for medicinal use as well as for the purpose of preserving milk and foods, though it is now being somewhat superseded by formic aldehyde." Carbolic acid as a surgical antiseptic dates from about 1868, while salicylic acid is of still later use, being rarely used before 1876. "The eucalyptus products were comparatively unknown here till 1880." The use of the active principles and alkaloids has risen almost wholly within the last twenty-five years. The mydriatics atropine, hyoscyamine, and scopolamine were not then defined, while homatropine had not been found nor physostigmine come into use. It is especially interesting to read his words on anæsthetics. He said: "As a general anæsthetic ether has to some extent replaced chloroform, which was almost solely used at that time." And then, just think of the host of "new remedies," the synthetic products of the past two or three years' discovery. If all this has been done in the past thirty years, what must we learn and do and endure in the next thirty? The modern physician must know about more than calomel, rhubarb, jalap and opium, which were about all that were required to stock the saddle bags of the practitioner of the times "befo' de wah."

Free Alcohol Decision Deferred.

The free alcohol movement is not dead, although any legislative action to that end cannot possibly take place before December next. Congress has granted to Senator Platt and his colleagues on the joint committee an indefinite amount of time for the consideration of the subject, and it is known that a bill has been prepared which will be submitted to Congress practically in its present form. The most important issue before the country at the present time, however, is the tariff question, and inasmuch as the tendency of the free alcohol bill would necessarily be rather to diminish the amount of the revenue, it is clear that no legislation in that direction can be put through until the income of the Government is sufficient to meet its expenses.

The tone of the daily press on this subject is a marked contrast to its tone in previous free alcohol campaigns. The daily newspapers, without regard to party, generally favor free alcohol on grounds of public policy, and all encourage home manufactures. The members of both houses of Congress are being bombarded by letters and petitions by manufacturers of every kind, who feel that under free alcohol they could do better. Thus, there is every reason to believe that when the bill is finally presented it will pass without difficulty. Indeed, it is reported that a canvass of the members of both houses has been made and a majority promised.

Drug Departments in Charge of Registered Pharmacists.

There have been reported several cases recently which tend to show that the courts are in favor of allowing any one to put his money into a drug store or a drug department, providing merely that who ever actually compounds and dispenses medicines shall be a duly qualified, registered, safe pharmacist. The Zacharias case in Philadelphia, the Siegel-Cooper Company case in this city, and very recently one against a department store in Canada have been decided to this effect. This is a sort of common sense way of looking at the matter which appeals to most people, and it is not at all strange that the druggists are generally beaten when they go to the courts for relief. We may not like it, but really there seems no logical grounds upon which to base a protesting argument. Even in States where the law may require the owner of a drug store to be a duly licensed qualified pharmacist, it is well known that this law is not always respected, perhaps nominally, but not in fact. Some wholesale druggists have been known to be the real owners of drug stores, the management being confided to a pharmacist whose name is placed over the door.

Druggists have a hard row to hoe, have to meet very severe competition, but it really seems hardly constitutional to debar an outsider from putting his capital into a drug store, provided (and this we have a right to insist upon) the management of it be placed upon a duly qualified druggist. If no one but druggists could establish, buy or sell drug stores, think what a commotion would be caused in the trade. The law can consistently go no farther than to require that the actual preparation, handling and adminstration of medicines be confined to safe hands.

To show the position held with regard to this question we quote from "The Law of the Apothecary," in which, referring to "partnerships," it is said:

> "It is provided that a partnership may exist for the purpose of carrying on a pharmacy, though only one of the partners is a registered or licensed pharmacist. This holds good in all the States, and cannot, on principle, be otherwise. It is not the ownership of the business, but the operating of it, which must be restricted. A number of persons may agree to form a corporation to the end that they may, after the corporation is formed, engage in the drug business. This corporation, being an artificial body, cannot of course pass an examination; still the business can be done, provided those who have the actual management and interior control are legally registered or licensed. Yet, in those States where the granting of renewals is largely a matter of discretion with the board or commission, it may be questioned whether a corporation could obtain such a license. So in New Hampshire, under the peculiar reading of the law that "all persons who shall desire to engage in the business of apothecaries shall be examined," it may well be doubted if such business could be done by a corporation. But the better opinion seems to be that any person, whether registered and qualified or not, may own the stock or be an owner in the stock in trade of an apothecary shop, so long as he takes no part in conducting the business."

The Vilest of Frauds.

There are stringent post office rules which, if enforced as they should be, would make it impossible for a certain class of swindlers to do business. The "lost manhood," "nervous debility" frauds thrive because they are very shrewd in the wording of their advertisements, and because the post office authorities and the express companies apparently make no attempt to get below the surface and ascertain the true character of the traffic, which is a fraud and deception from start to finish. It is to be wondered, too, what sort of conscience and moral sense is possessed by newspaper proprietors (and religious papers are the worst of the lot) who print the lying advertisements of these concerns, and what sense of respectability must be that of bankers and other business men who allow their names to be printed as references.

In Michigan the surveillance of these fakes seems to be conspicuous by its absence, for that state fosters a brood of them, at Marshall, Battle Creek, Delray, Kalamazoo, etc. The last named city is cursed with one of the worst of them, who uses the name Thomas Slater, and is particularly nervy and obnoxious in his methods. He buys large space in the papers and uses the name of a reputable bank as reference, apparently without protest of the honest inhabitants of that fair city, whose duty is and effort should be to squelch the disreputable enterprise which is bringing such unenviable notoriety upon them. A description of this man's methods will serve as a description of the many others of the same type.

Under the heading "Free to Every Man," or a similar one, he describes his (?) symptoms during the years he "rolled and tossed about on the troubled sea of sexual weakness," and offers to send "the method of this wonderful treatment free." An answer to the advertisement brings back a circular letter from Slater, carefully gotten up in imitation of a dictated and copied typewritten letter, in which he pretends to be a philanthropist, and asks the recipient to fill out an enclosed blank giving symptoms, and to send it to the Michigan Medicine Company of Kalamazoo. The letter is so suggestive that it cannot be published here, and the questions asked are of a revolting character.

Up to this point the promise has been that everything was to be free, but as soon as the medicine people get confidential information about the victim's youthful errors and his hopes of marriage, they assume a more domineering tone. All their correspondence is run off a printing press by the hundred, but in careful imitation of one person's handwriting or of copied typewriting. The circulars are particularly obnoxious, describing in detail symptoms (or supposed symptoms) which are shrewdly calculated to make the poor victim believe he is a sufferer from the most horrible of diseases and to be almost in extremis. After frightening them nearly to death the game is merely to run their patients through the mill by working off on them successive circulars till a package of medicine is sent C. O. D. After this course has progressed a while, further correspondence is conducted, with a view to the patient's taking supplementary treatment owing to the interesting and complicated character of his troubles.

It is a stigma upon Kalamazoo that it should allow such an institution to exist within its borders; it is a disgrace to the journalism of that city that one of its evening newspapers should print the advertisements of the concern, and it is not to the credit of the physicians, druggists and others interested in medicine, and the business men generally that they do nothing to abolish the Michigan Medicine Company and Thomas Slater. And, too, the quicker the post office issues a "fraud order" and enforces it against the malodorous enterprise the better for the morals of that community and the choice collection of "suckers" reached by the advertisements. There are laws enough to make it impossible to work the scheme either through the mails or the express companies, if the authorities were but alive to their duties and responsibilities.

* * *

The following are the regulations prohibiting the carriage of objectionable and obscene matter in the United States mails or by the express companies:

In the Mails.

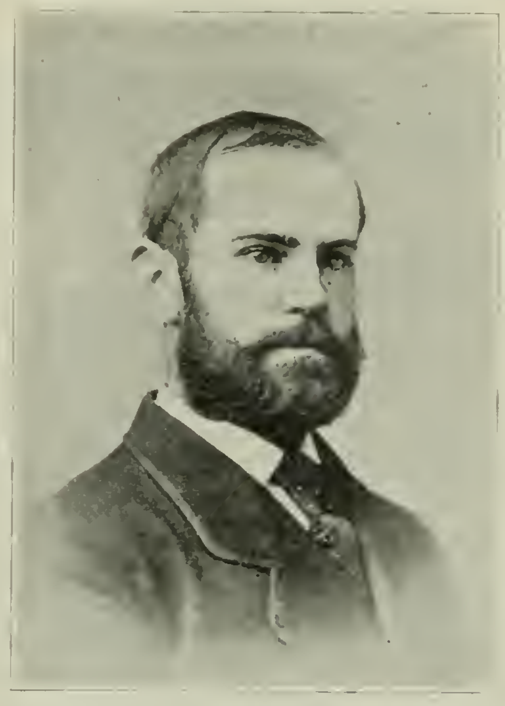
Postal Laws and Regulations. Sec. 333. Obscene Matter. —Every obscene, lewd or lascivious book, pamphlet, picture, paper, letter, writing, print, or other publication of an indecent character, and every article or thing designed or intended for the prevention of conception or procuring of abortion, and every article or thing intended or adapted for any indecent or immoral use, and every written or printed card, letter, circular, book, pamphlet, advertisement, or notice of any kind giving information, directly or indirectly, where or how or of whom or by what means any of the hereinbefore mentioned matters, articles or things may be obtained or made, whether sealed as first-class matter or not, are hereby declared to be non-mailable matter, and shall not be conveyed in the mails nor delivered from any postoffice, nor by any letter carrier and any person who shall knowingly deposit, or cause to be deposited, for mailing or delivery, anything declared by this section to be non-mailable matter, and any person who shall knowingly take the same, or cause the same to be taken, from the mails for the purpose of circulating or disposing of or of aiding in the circulation or disposition of the same, shall, for each and every offense be fined upon conviction thereof, not more than $5,000 or imprisonment at hard labor not more than five years, or both, at the discretion of the court. And all offenses committed under the section of which this is amendatory, prior to the approval of this act may be prosecuted and punished under the same, in the same manner and with the same effect as if this act had not been passed. Provided, That nothing in this act shall authorize any person to open any letter or sealed matter of the first class not addressed to himself. (Sec. 3893 R. S., as amended Sept. 26, 1888.)

By Express Companies.

Act of Congress, approved Feb. 8, 1897.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That it shall be unlawful for any person to deposit with any express company or other common carrier from one State or Territory of the United States or the District of Columbia, to any other State or Territory of the United States or the District of Columbia, any obscene, lewd, or lascivious book, pamphlet, picture, paper, letter, writing, print, or other matter of indecent character, or any article or thing designed or intended for the prevention of conception or procuring of abortion, or any written or printed card, letter, circular, book, pamphlet, advertisement, or notice of any kind giving information directly or indirectly, where, how, or of whom, or by what means any of the hereinbefore mentioned articles, matters or things may be obtained or made; and any person who shall knowingly deposit, or cause to be deposited, with any express company or other common carrier for carriage from one State or Territory of the United States or the District of Columbia, to any other State or Territory of the United States or the District of Columbia, or who shall take from such express company or other common carrier with intent to sell, distribute, or circulate any matter or thing herein forbidden to be deposited for carriage, shall for each offense, upon conviction thereof, be fined not more than $5,000, or imprisonment at hard labor not more than five years, or both, at the discretion of the court.

As violations of the above act are in many cases the results of previous correspondence of an unlawful nature, the circulation of which by mail is forbidden by the act of Sept. 25, 1888, amending Section 3893, R. S. (Sec. 333, P. D. and R.), employés of the postal service are directed to report such violations coming to their knowledge to the inspector in charge of the division, who will advise the United States Attorney for the District in which the offense occurred of all the facts within his knowledge.



Charles C. Gardner.

The retail druggist who receives a letter from Lazell, Dalley & Co., nine cases out of ten receives a letter dictated by Charles C. Gardner, secretary of that concern. Mr. Gardner has charge of a large share of the detail work in the management of this perfumery house, and his labors consume not only all day at the office, 12 Duane street, New York, but oftentimes a share of the night also, at his home in Newark, N. J., from which it will be seen that he is a very busy man.

The manufacturing is in charge of Edwin H. Burr, and the credits are in charge of Mr. Lazell, but the man who comes most closely into relations with the retail druggist is Mr. Gardner. He was born forty-four years ago in Piermont, N. Y., received a common school education in Charleston, S. C., and, at the age of twelve years, came to New York City, and secured employment as an errand boy in McKesson & Robbins'. He worked his way up to the position of manager of the Southern department of that house. He was with McKesson & Robbins fourteen years. The next twelve years of his life were devoted to a study of the plaster industry, first as an employé of Grosvenor & Richards, and afterwards with Seabury & Johnson. In 1892 he identified himself with Lazell, Dalley & Co., and was made secretary of the company in January, 1895.

Mr. Gardner's chief characteristic is his directness. His business letters are models of clear and concise English, and in entertaining a business proposition made by a visitor at the office he is quick to see the point, and to come to a correct conclusion. He was married in 1882 to Miss Virginia McNair, of Newark, N. J. They have three children.

MAGNESIUM WOLFRAMATE ($MgWo_4$).—A coarse crystalline powder, which is insoluble in water. Used as a fluorescent medium for the Roentgen rays.

LITHIUM - RUBIDIUM-PLATINO-CYANATE (Li. Rb. Pt. $(CN)_4$).—Greenish crystalline needles, soluble in water. This salt exhibits a remarkable fluorescence when exposed to the Roentgen rays.

PIPERIDIN-DI-URATE.—A product obtained by dissolving piperidin in an excess of uric acid. It is said to possess greater solvent properties than piperazin.

Correspondence.

We are pleased to publish here communications from our readers on topics of interest to the drug trade. Writers are requested to express their views as briefly as possible. Each article must be signed by its writer, but his name will not be published if so requested.

"*Just as Good.*"

Editor Pharmaceutical Era:

I ask you to kindly publish the following as my views on the substitution problem:

Of all business prevarications and questionable "tricks of trade" practiced by unscrupulous dealers, one of the most harmful and contemptible is the substitution of one article for another, and claiming that an attempted imitation is "about the same thing" or "just as good" as the goods the customer asks for. The wrongfulness of such acts is worse than ordinary, and more reprehensible when the article in question is medicine, for the druggist who, under the specious falsehood of "just as good" palms off a cheap substitute, wantonly risks not only the money of his customer, but his health, and mayhap his very life itself. This practice is found to exist where high grade, well-known and thoroughly tried remedies are in question, and the damage done is all the greater, the wrong all the more glaring. Such successful remedies are generally demanded by those who have had them recommended by physicians or by friends benefited by them, when all else failed; their potency and long record of cures have given them such a high reputation that they are in active demand. Unscrupulous dealers take advantage hereof, and for the sake of a little extra gain, endeavor to substitute inferior preparations, by all manner of smart subterfuge and misstatements, claiming the most vile, worthless and frequently dangerous concoctions as being "just as good"; such practice is bound to react against the dealer, as the public is becoming rapidly aware of these deceptions, and in many cases customers have stopped purchasing from druggists who adopt such methods.

As it may be possible that in instances overzealousness on the part of employés prompts the methods aforesaid, it is to be hoped that employers will use every endeavor to correct what has become a sort of habit, and under no circumstances countenance misrepresentations and substitution, so that a customer may feel sure when entering a drug store, that he will receive strictly just what he asks for and thus do away with the now almost proverbial "just as good." Yours truly,

MANUFACTURER.

(Concluded from Page 390 *April* 1.)

*THE THERAPEUTICS OF EMERGENCIES.**

By H. MACNAUGHTON JONES.

Injuries to the Eye.

Foreign Bodies.—To evert the eyelid, place the person opposite you, lay the forefinger (left for the right eye and vice versa) on the closed upper lid, directing the patient to look down; now slip the edge of thumb under the margin of the lid, seize it firmly but gently, and turn it over on its cartilage—or a stout probe or a thin penhandle may be used to turn it over on. Use a magnet for steel particles resting on the cornea; any imbedded particles do not interfere with; temporarily use the same means as in abrasions and occlude the eye. A camel's hair pencil, wet with a little boric water, may be used to wipe a loose particle of dust off the cornea. Examine the eye through an ordinary lens; if no particle is seen, place the person opposite a good light and evert the upper eyelid with the finger and thumb and search for it. If found it is easily removed with the camel's hair pencil or the pointed portion of a soft handkerchief. After removal drop in castor oil and cocaine.

Heat and Cold.—Be careful in advising the application of heat or cold to an eye. Either agent is at times a powerful remedy, and, as a rule, should be left entirely to the discretion of a doctor.

More Serious Injuries, such as wounds with scissors, stab of knife, gunshot injuries, portions of broken glass, etc.—there should be no interference without the advice of a surgeon, but if there be unavoidable delay in his coming the eye may be occluded lightly, and a drop of 1 per cent. solution of atropine placed in it, and a shade may be made to cover both eyes.

Injuries to the Ear.

Any serious injury to the ear from blows or other accident should not be interfered with. Any bleeding from the outer passage of the ear is always a serious indication.

Foreign Bodies in the Auditory Passage.—No matter what may be the nature of the foreign body, never attempt to extract it with any instrument. Gentle syringing only is permissible.

Insects in the Auditory Passage.—Drop some warm oil into the ear, and afterward syringe gently with a warm solution of carbonate of soda.

Violent Earache.—In all cases of aural neuralgia, or earache, the pharmacist should not accept any responsibility. In children such a symptom may be the forerunner of most dangerous brain trouble, and at all times may be indicative of abscess and middle ear inflammation. Temporarily, warm laudanum fomentations, or carefully strained poppy water may be used, and no harm can be done by dropping in a little 10 per cent. solution of cocaine in glycerin to try to relieve pain.

Poulticing and Syringing.—Never advise the poulticing of an ear. It should be remembered that syringing frequently is the source of mischief and danger. Even in the simple removal of wax this is the case; inasmuch as the syringing is often continued after the ceruminous grub is washed away, so that the exposed drum is subjected to the force of the water. At other times the ear is dangerously syringed when there is no wax present. On the whole, the syringing of the ear should devolve on the surgeon alone, or be done under his direction.

The Nose.

Foreign Bodies.—Do not interfere by any efforts of extraction with foreign bodies in the nose. They are liable to be pushed up or further back, and to become lodged out of sight. Let a doctor see the case.

Bleeding.—In old people and in patients who are bleeders it may be most difficult to arrest bleeding, and finally the posterior nasal apertures may have to be plugged. It is safer, therefore, to accept no responsibility in such cases. In ordinary bleeding from the nose, a cold key, a stone, or some ice wrapped in lint protective, placed on the nape of the neck, will frequently, by reflex action, arrest it. Small plugs of lint moistened with equal parts of tincture of matico and liquid extract of hydrastis, in which a little tannic acid is suspended, may be pushed up the nostrils; but in any case of persistent bleeding medical assistance should be had.

Mouth and Throat.

Foreign Bodies.—If a fish bone or other foreign body is stuck in the fauces, and within reach of the finger, it may be hooked up with the latter. If a piece of meat or soft substance be stuck in the gullet, an extemporized probang may be made with a piece of flexible cane or stiff whalebone, to the notched end of which a piece of wadded leather is firmly tied, and the soft morsel may be pushed on into the stomach. Hard or angular substances should not be interfered with; leave them to the surgeon.

Accidents to the Jaw.—If the lower jaw be broken it will greatly relieve pain and distress to support it by a pocket handkerchief folded triangular-wise and tied over the head, or by a four-tailed bandage, which is crossed and tied over the vertex and behind the ears. Should the jaw be dislocated, as in excessive yawning, it may be returned by placing the thumbs wrapped in a pocket handkerchief or towel, over the molar teeth at either side, and, while depressing the bone with these, raising it into position with the fingers, which are carried under the sides of the jaw.

Wounds.

The Scalp.—Cut the surrounding hair, wash the wound carefully with carbolized water from any dirt or particles that may be in it, put on a pad of wet boric lint, and send the case to a doctor.

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*Abstract in Chem. and Drug. of a lecture to the Chemists' Assistants' Association (London), February 18.

Palm of Hand.—Take a cork, roll some lint round it, place it in the center of the palm and bind the hand over it with a bandage.

Blood-vessel.—If the vessel can be compressed, cut a round piece of cork, cover it with lint, and place it over the bleeding point. Lay over this pieces of lint, of gradually increasing size, and secure this cone-shaped pad with a bandage, and send for medical assistance immediately. If the wounded vessel be in the flexure of a joint, as in the knee, groin, or elbow, place a pad over it and strongly flex the limb, keeping it in this position until assistance be secured.

Throat.—Send for medical aid immediately, and in the mean time keep the head well bent on the chest.

Abdomen.—The great danger is shock. Let medical aid be had without delay. If severe shock be imminent, use restorative measures, such as a little brandy by mouth and rectum, ammonia to the nostrils, or 30 minims of sulphuric ether given subcutaneously.

Testicle.—Kicks, or other injuries, are apt to be followed by shock; also hæmorrhage may take place into the scrotum. In the case of shock use restorative measures, keep cold to the part, suspend the testicle in the following manner: Carry a bandage or long pocket handkerchief round the waist; take another large pocket handkerchief folded triangular-wise, and carry the base of the handkerchief well under the scrotum, two corners being brought underneath the waistband; tie these and the third corner together.

Bite from a Rabid Dog.

If the bitten person be brought to a pharmacy, the first step is to ascertain the evidence on which the animal is suspected to be mad, and if symptoms of rabies have been present. Should this be so, send immediately for a surgeon. Only under exceptional circumstances should the pharmacist do anything to the bite beyond thoroughly cleansing the wound, and the frequent application of hot water to it. To this latter may be added mercuric perchloride, making the strength of the solution 1 in 1,000. Should any time unavoidably elapse before a doctor can arrive, it is better to cauterize the wound by dipping a pointed stick into fuming nitric acid and carrying it deeply into each tooth-hole. Let a veterinary surgeon at once see the dog, and take the responsibility of its destruction.

Syncope.

To treat syncope of the ordinary kind, such as fainting, lay the patient on the back, elevate the legs, use strong ammonia to the nostrils, loosen all clothing, apply friction to the chest wall, flick it with the corner of a wet towel, sprinkle water on the face and make the patient swallow a little sal volatile or brandy. In more serious syncope from shock resort to artificial respiration, give a subcutaneous injection made from a strychnine tabloid dissolved in water.

Hæmoptysis and Hæmatemesis.

In cases of sudden rupture of a lung blood-vessel (hæmoptysis), while waiting for the doctor, lay the person down, give a little ice to suck, and some sips of a mixture of gallic acid and liquid extract of ergot until the doctor arrives. In the instance of rupture of a gastric vessel (hæmatemesis) and vomiting of blood send immediately for medical aid. After the blood has been gulped up, wait a little, and then give a dose of gallic acid with hazeline. In neither case assume any further responsibility.

SOZOBORAL.—A mixture of borax, sozoiodol and aristol, intended to be used as a snuff.

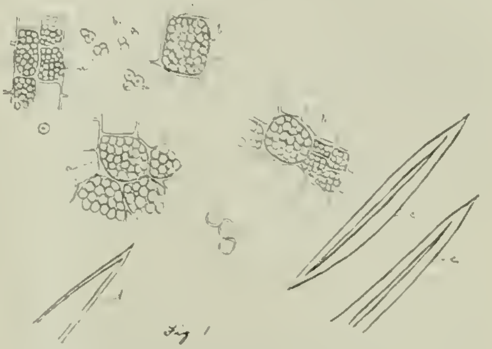
AMYLOCARBOL.—A solution of phenol containing 150 p. of soft soap, 160 p. of amyl alcohol, with water sufficient to make 1,000 parts.

DISTINCTIONS BETWEEN ROOT AND STEM BARK OF SASSAFRAS, WHEN IN A POWDERED CONDITION.

A STUDY UNDERTAKEN UNDER THE DIRECTION OF RESEARCH COMMITTEE "C," OF THE REVISION COMMITTEE OF THE U. S. P.

By KATHARINE C. BURNETT.

The cells of the sassafras root bark are large and thin-walled, and filled with starch. In the powder, therefore, the cells are much broken up. We see quantities of starch. The starch grains are nearly spherical, showing angularity only when they are pressed upon. The grains are in groups, of from two to five, rarely single, and are small, the largest no larger than from twelve to fifteen micromillimeters. The hilum is a little to one side of the center. There are very few bast fibers and these are generally detached.



Some Cells Seen in Powdered Root Bark Taken in December. × 260.

Tissue loose and easily broken.

a. a.—Many large thin-walled cells much broken up.

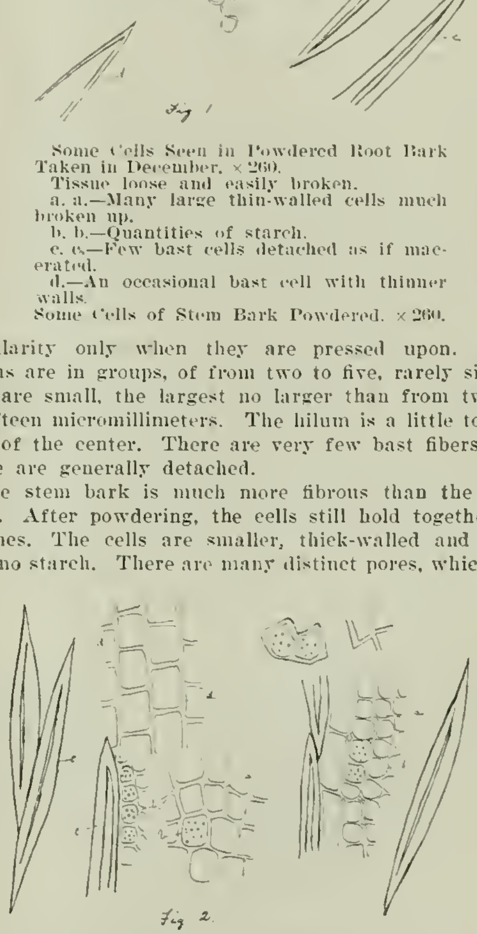
b. b.—Quantities of starch.

c. c.—Few bast cells detached as if macerated.

d.—An occasional bast cell with thinner walls.

Some Cells of Stem Bark Powdered. × 260.

The stem bark is much more fibrous than the root bark. After powdering, the cells still hold together in patches. The cells are smaller, thick-walled and contain no starch. There are many distinct pores, which we fail to find in any of the root cells. There is much bast fiber, not detached as in the root, but accompanied by square, thick-walled cells.



Tissue compact and not easily broken up.

a. a.—Many unbroken thick-walled cells. No starch.

b. b.—Many pores.

c. c.—Many bast with accompanying cells, as this portion of a medullary ray.

d.—Sometimes tissues can be recognized.

By clearing with potassium hydrate, or by mounting over-night in glycerin, these characteristics are easily distinguished.

Evidences of stem bark can be distinguished even in a 10 per cent. adulteration of stem bark.

*THE RELATIONS THAT SHOULD EXIST BETWEEN PHYSICIANS AND PHARMACISTS.**

It is natural that each one should look on everything from his own standpoint, and it is also a true saying that there are two sides to every question. Occupying both the position of physician and pharmacist, I think I can with impartiality view the situation. I see no reason why the physician and pharmacist should not entertain in all respects the kindliest feelings for each other, and I believe, as a rule they do. Here and there, possibly, we meet with a crank of a doctor, who, living in a city with all the advantages of well-established drug stores, thinks it his duty to himself and to his patients to resurrect the saddle-bags of fifty years ago and travel around among his patients, spend half an hour or more at each house, meting out calomel, Dover's powder, blue mass, etc., in powders or pills, instead of taking what time he can spare to make a full and correct diagnosis of the case and cheer his patients by a smiling face and encouraging word, writing his prescriptions on a neat blank, and sending it to the prescription counter to be attractively put up in capsules or tablets, which are placed in a box where they can be kept and preserved. Now, this physician, doubtless, in the first place thinks the pharmacists make too large a percentage or profit on prescriptions. I would remark, let him try an investment in a drug store and see for himself if injustice is done to any one. Secondly, he has not kept well abreast of the times, or he would soon discover that a physician cannot dispense as he would like from his saddle-bags; he cannot afford to have the variety (especially of new remedies) that the pharmacist is compelled by the demands of trade to keep constantly on his shelves. And, thirdly, our friend, the doctor, cannot have very much to do, or he would not have the time to devote to this business. Now it requires some tact to deal with such a one, but by such polite attentions as are appreciated by any one and by occasionally supplying him with some of the recent preparations in attractive form, we will after a while win the good feelings of our friend and eventually make him feel, not only the convenience, but the necessity of having a well-trained pharmacist to whom he can refer his prescriptions, some of them difficult, troublesome to prepare, and requiring the everyday practice of the skilled pharmacist. In thus gaining to our side one of this character we have accomplished much; not only the goodwill of the physician, but he inspires confidence in the pharmacist, in the mind of all his patrons.

The relation between the physician and the pharmacist should be of a pleasant, social nature, and, further, it should be of a confidential nature. To obtain the latter, we must have the former. A genial manner on the part of each one is of great advantage, a short, rough manner is not calculated to attract. Politeness is always characteristic of the gentleman, and any one entering upon either the practice of medicine or the practice of pharmacy should ever realize this. Be polite, be courteous, be attentive, be accommodating and success may be assured.

Let the physician feel a hearty welcome to your store, make him feel at home there, show him new medicines just received, interest him in the chemical experiments you are making, and neither the physician nor the pharmacist, particularly the latter, should forget or neglect his chemistry, a study interesting in itself and of the utmost importance to the pharmacist. Compound his special or favorite formulæ for him, and you cannot find a physician who has not some special formulæ for whooping cough, chills and fever, or something else; let him see that you are interested in putting this up in a pleasant and attractive form that will make the "babies cry for it."

Thus you establish social relations with the physician that draw him to your place of business, and a continuance of kindly, social intercourse develops into relations of a confidential nature.

In the hurry of a busy day or amid the oftentimes confusing conversation in the sick room the physician may leave off the quantity of some ingredient, or the vehicle that he intended the principal ingredient conveyed in; the prescription is sent to the drug store, at once the pharmacist sees the omission or the mistake; would it not be the proper courtesy, and further a protection to the reputation of the physician to ask the one bringing the prescription to call in a short while when you will have it ready? In the mean time hunt up the prescriber and call his attention to the error and allow him to correct it; he appreciates this little attention and his reputation is sustained. On the other hand, the pharmacist, like all else that is human, is liable to err; he may put a 4-ounce mixture when a 2-ounce one was prescribed; he may put up powders when capsules were wanted; and then it falls to the lot of the physician to protect the reputation of his friend, the pharmacist, and give his directions in such a way as not to reflect on the druggist, or allow the patient or attendants to think that a mistake has been made.

Next—Never substitute. It is your duty to the patient, to the physician and yourself to compound exactly what has been prescribed and nothing else. Do not deviate in the slightest thing from the written prescription and you gain the confidence of the physician, and ere long you hear of his remarking, "I can always depend on Mr. Smith in filling my prescriptions; he puts them up in a neat and attractive way and he puts in precisely what I prescribe," and his patrons soon learn not only where to have their prescriptions filled, but also where to buy other things in the druggist's line, for having confidence in one thing they have it in all.

But sometimes you may not have just what the doctor wants, and you cannot get it in the city. A rare medicine, perhaps, an old one long gone out of use, but resurrected for some particular case, communicate with him at once, and let him know that it cannot be obtained; it is his province and his privilege to say what shall be substituted, not yours. And if he is specially desirous of using this particular remedy, order it at once, and have it in stock next morning, if possible. Promptness in meeting the wants of a physician, or the wants of any patrons, inspires a confidence and a respect that are hardly gained by anything else.

The most difficult subject to deal with pertaining to the relation of physician and pharmacist is what is usually termed "counter prescribing." No doubt in many cases this is carried to too great an extent by some pharmacists, sometimes to the detriment of the patient and the injury of the physician. It appears to be a simple cold, but it may be the incipient stage of pneumonia, which, being properly taken in hand now, might possibly ward off a severe attack of sickness with corresponding expense and anxiety. A pharmacist, intelligent and conscientious, will see the necessity of a physician's attention, and candidly tell the man that he requires one skilled in diagnosing his case and prescribing proper remedies; you gain the confidence of patron and physician.

But, on the other hand, there are many cases of a trivial nature—a headache, a slight indigestion, a little nervousness after last night's entertainment, or other mild ailment that a man does not wish to pay $1 for a prescription, and, consequently, goes to his druggist for a dose of acetanilide, a drachm or two of elixir of pepsin, a dose of bromide of potassium, or other simple remedy that he can take and go about his business. Now, viewing this subject from the standpoint of physician and pharmacist, I do not see that any physician has a right to make complaints at this course; but run no risks, and in every case other than the most simple and transient, advise your customer to seek the advice of a physician, who by training and practice thoroughly understands what to do. By this course you further gain the respect of the physician and those relations, social and confidential, that are so necessary to pleasant intercourse between physician and pharmacist are increased to a degree that will bring you nearer together and make each one work for the interests of the other, at the same time enjoying a conscious feeling of duty performed to patient, physician and self.

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*Address delivered before the S. Car. Pharm. Association at Columbia by Dr. Hughson, of Sumter.

*NOTES ON SOME PALATABLE PREPARATIONS.**

BY FRANK EDEL.

The introduction of the powerful sweetening agent, saccharin, has placed in the hands of the pharmacist a most useful agent for the purpose of making medicines palatable. A pure saccharin, dissolved in a small amount of hot alcohol, and this added to castor oil, yields a preparation much more agreeable to the taste than the plain oil. The introduction of the modern elixir was the first great step toward palatability in medicines, a breaking away, so to speak, from the old disgusting mixtures and draughts then in vogue. While it was possible to accomplish much with aromatics and licorice with sugar, it was far from the results obtainable with saccharin.

The preparation of licorice I have used is the solution of licorice of the National Formulary. This, in my opinion, is the most efficient liquid preparation of licorice made. To those who do not desire to go to the trouble of making this preparation, the following will be found to answer the purpose very well:

Solution of Glycyrrhizin.

Ammoniated glycyrrhizin	1 ounce
Water, q. s., ad	16 fl. ounces

Dissolve by heat.

The elixir of licorice aromatic was the first preparation introduced for disguising the taste of quinine that could be considered efficient, but it has largely been replaced by the more efficient syrup of yerba santa aromatic.

The National Formulary gives a formula for making this preparation, and, while the product of this formula yields an efficient preparation for masking the taste of quinine, it is far from being an elegant pharmaceutical. The best made syrup becomes murky in standing, so I prefer to mix it as wanted from the aromatic fluid extract. The preparation is four times the strength of the aromatic syrup, is easily made, and does not deteriorate, but actually improves on standing. The following formula is the one used by myself, with the best satisfaction, for the last seven years:

Aromatic Fluid Extract of Yerba Santa.

Fl. extract yerba santa	2 ounces
Oil cloves	32 drops
Oil orange	16 drops
Oil sassafras	16 drops
Alcohol	3 fl. ounces
Liquor potassa	12 fl. drams
Fl. ex. cardamom comp	4 fl. drams
Glycerin	Enough.
Water	4 fl. ounces
Purified talcum	Enough.

Mix the fluid extracts and oils, then add the solution of potassa and water, mix with the talcum, then add the alcohol and filter, returning the first filtrate till it comes through clear; then add enough glycerin to make one pint. This makes a nice preparation, and one which is readily miscible with water, elixirs or syrups. In many instances I prefer the following combination:

Aromatic Syrup of Yerba Santa.

Fl. Ex. Yerba Santa aromatic as made above	3 fl. ounces
Solution licorice	1 ounce
Saccharin	30 grains
Syrup, enough to make	32 fl. ounces

Some competent authorities contend that buckthorn is equal, if not superior, to cascara sagrada as a medicine. While it is possible to make cascara pleasant tasting, it is an easy matter to convert any good fluid extract of buckthorn into an aromatic extract. For example:

Sweet Fluid Extract of Buckthorn.

Fl. ex. buckthorn	16 fl. ounces
Liquor potassa	1 dram
Solution licorice	2 fl. ounces
Saccharin	1 dram

Take 3 fluid ounces of the fluid extract, reduce by evaporation to ½ ounce, dissolve in the rest of the fluid extract, add the solution of potassa, saccharin and licorice.

The resulting product is a pleasant tasting, sweet fluid extract of buckthorn, equal in every way to the ordinary extract as medicine.

The writer in his experiments in aromatic fluid extracts of cascara sagrada, found that by making a good non-bitter extract of cascara sagrada, by means of magnesia, the addition of 2 ounces of solution of licorice and 1 dram of saccharin to each pint, made an elegant aromatic extract. The formula is given below. This formula was recommended by L. F. Stevens, in a paper read before the Kings County Pharmaceutical Society. The author, however, recommended a very slight modification of my formula. For the sake of completeness the formula recommended by him is also given:

Bitterless Aromatic Fluid Extracts of Cascara Sagrada.

Cascara sagrada	1	pound
Calcined magnesia	1½	ounces
Glycerin	2	ounces
Solution licorice, N. F.	2	ounces
Saccharin	30	grains
Oil fennel	10	drops
Alcohol	12	fl. ounces
Dilute alcohol	Enough.	
Water	Enough.	

Mix the cascara and magnesia, moisten with water and set aside for 48 hours. Then pack in a percolator, pour on the alcohol and let stand, well covered, for 12 hours. Percolate with dilute alcohol, reserving the first 12 fluid ounces passing, until exhausted. Recover the alcohol from the second portion of the percolate; evaporate to the consistence of a soft extract; dissolve the extract in the reserved percolate; finally, add the remaining ingredients.

The formula, as modified by Stevens, is as follows:

Cascara sagrada	500	grams
Calcined magnesia	50	grams
Water	550	cc.
Glycerin	120	cc.
Alcohol	400	cc.
Purified extract licorice, N. F.	120	grams
Saccharin	2	grams
Oil fennel	0.31	gram
Dilute alcohol	Enough.	

Mix the cascara and magnesia, moisten with water and macerate for several hours. Pack the mixture in a percolator and allow to macerate 48 hours, then add the alcohol and allow to macerate for 12 hours. Now percolate with dilute alcohol and continue until the drug is exhausted. Reserve the first 400 cc., and recover the alcohol, commencing with the most dilute of the liquors. Evaporate the whole until it measures 380 cc., including the glycerin; add the licorice, saccharin and oil of fennel, the whole to measure 500 cubic centimeters.

Either of these formulas yields a satisfactory preparation, and either is much to be preferred to the product of the National Formulary.

For an elixir of cascara aromatic after the style of cascara cordial, etc., the writer some years ago recommended the following formula:

Aromatic Elixir of Cascara Compound.

Cascara sagrada	100 grams
Calcined magnesia	30 grams
Water	100 grams

Mix the cascara and magnesia, moisten with water thoroughly, allow to macerate 12 hours, then pack in a percolator and macerate for 48 hours. Add 100 cc. of alcohol. Continue percolation until 400 cc. of percolate is received. Then take of—

Berberis aquifolium	37 grams
Coriander	17 grams
Angelica root	2 grams

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*Abstracted from West. Dr.

Oil anise	1.3 cc.
Oil orange	1.3 cc.
Oil cinnamon	1 cc.

and moisten with the above percolate for 24 hours. Then percolate with the 400 cc. of menstruum, adding water to the same until the whole measures 800 cc. Lastly, add 4 ounces of solution of licorice, 400 grains of sugar, and 2 grams of saccharin, the whole to measure 1 liter, or 1,000 cc.

Among new remedies kola seems to be the fad, and we are treated with many aromatic combinations of the nut under many different fanciful names. An aromatic elixir of kola can easily be made as follows:

Aromatic Elixir Kola.

Fluid extract kola	2 ounces
Saccharin	30 grains
Solution licorice	41 drams
Simple elixir, enough to make	16 fl. ounces

Let stand for several days and filter.

In a similar manner an aromatic wine of kola can be made.

I have found in practice that the following elixir forms a very excellent adjuvant elixir, and is decidedly efficient in disguising the taste of many disagreeable drugs:

Adjuvant Elixir.

Solution licorice, N. F.	1 ounce
Saccharin	15 grains
Elixir orange	q. s. ad. 16 fl. ounces

Mix and filter.

Elixir Cathartic Compound.

Fluid extract rhubarb	1 ounce
Fluid extract buckthorn	2 ounces
Fluid extract senna	1½ ounces
Oil peppermint	10 drops
Liquor potassa	30 minims
Saccharin	30 minims
Solution licorice	4 drams
Elixir aromatic, enough to make	16 fl. ounces

Let stand for 24 hours and filter, if necessary.

Thus I might go on and multiply formulas, but I will only call attention to a few of many combinations where the use of saccharin would be advantageous, viz.: In preparing wine and elixirs of coca, blue flag, juglans, black haw and its combinations, cramp bark, wahoo, etc. In many of these it certainly removes the objectionable taste, while in others the taste is modified considerably. This line of investigation is of peculiar advantage to the pharmacist, and intelligent experimental work will accomplish much that is good.

HAPPY HOURS WITH EMERSON.

NOT THE LITERATEUR BUT THE POPULAR INVENTOR OF BROMO-SELTZER.

Dr. Isaac E. Emerson, of the Emerson Drug Company, Baltimore, believes in sharing the good things of life with his friends, and so he came up to New York and invited a select party to meet him at the Waldorf Hotel, April 1, at 4 P. M. Although it was All-Fool's Day, there was no hoax about the invitation, for shortly after the hour mentioned the gay tooting of a horn called attention to the approach of Dr. Emerson's yellow and black tally-ho coach drawn by four prancing horses.

The favored guests numbered eleven, and they filled the top of the coach, two or three being crowded inside of the vehicle. It was one of those days which Vassar girls call "gorgeous," the sky being almost cloudless, and the air partaking of the snap and tone of winter, tempered by the mildness of approaching spring. Dr. Emerson held the reins, and as the gay equipage wheeled into Fifth avenue the merry bugler on the boot attracted the attention of all within sight on this fashionable thoroughfare. The route was up Fifth avenue to the Fifty-ninth street entrance of the Park, and diagonally across to the West Seventy-second street gate, out West Seventy-second street to the lower end of Riverside Drive, and up the Drive to Grant's tomb. At Claremont a stop was made for a little nerve sedative, which was found to be necessary to restrain the enthusiasm of some of the younger members of the party; it was not bromo-seltzer, however. Here another convivial spirit joined the party, making just thirteen with the host, who declared that although he was willing to drive with twelve in the party he would not trust himself with thirteen, and the coachman held the reins going back.

The return route was through the Park, which was entered at West 106th street. The gay vehicle or the magnetism of the party was responsible for the fact that large numbers of bicycle riders followed after.

The Waldorf was reached just in time for a delightful dinner, but one of the guests, Theodore Weicker, of Merck & Co., pleaded a previous engagement, thus preventing the fatal thirteen from sitting down to the table together. The meal was served in the Astor dining room of the hotel, at a round table. As one of the guests remarked, it was one of the prettiest sights he had ever seen. The illumination was from candelabra and individual candlesticks with red and brown shades, and the decorations consisted of a large tapering vase of pink and white carnations, with a quantity of the same flowers spread out upon the table radiating from the base of the vase.

The dinner was entirely informal, and the guests seated themselves as they chose. Following is the list of those present: Dr. Emerson, T. M. Horner, of the Emerson Drug Company; James Hartford, of Schoellkopf, Hartford & Maclagan; Henry T. Jarrett, of the Mallinckrodt Chemical Works; W. Townley Case, of Boehringer & Soehne; W. W. White, of the Roessler & Hasslacher Chemical Co.; John M. Peters, of the Oil, Paint and Drug Reporter; W. Espenor Lord, of the National Druggist; H. J. Schnell, of the Druggists Circular; Hugo Kantrowitz, of the Apotheker-Zeitung, and Charles W. Parsons and George M. Simonson, of the Pharmaceutical Era. Following is the menu:

Manhattan Cocktails
Haute Sauternes
Oysters
Clear Green Turtle Soup
Planked Shad
Pommery Sec.
Cucumber Salad
Mushrooms sou cloches
Mignons Chinons
Potatoes Laurette
Sorbet with Maraschino
Partridges stuffed and roasted
Romaine Salade
Camembert Cheese
Liquors
Café

Just as the simplicity of the decorations constituted a charm, so the informality of the gathering rendered it unusually delightful. There were no set speeches. Anybody who could contribute a bright thought was free to do so, if he was able to get a word in edgewise. Mr. Hartford related an experience of his younger days on a tally-ho. Several of the party were Englishmen, and John M. Peters got off one of his good ones at the expense of the Englishmen. But space forbids even a recapitulation of the good stories that were told. Just at the close of the dinner a thirteenth man arrived, in the person of John F. Waggaman, vice-president of the Emerson Drug Company, but it was voted that he could never bring ill-luck, and he was compelled to sit down and drink a friendly glass before the party dispersed at a late hour.

——The Texas State Pharmaceutical Association holds its annual meeting in Galveston on May 18, 19 and 20, 1897. Thomas McGork is local secretary. This, it is expected, will be the largest and most enthusiastic meeting ever held in the history of the association.

ARSENHAEMOL.—A brown powder, which contains in 100 parts exactly one part of arsenous acid.

EMPIRE DRUG COMPANY WANTS MONEY.

THE NEW YORK STATE CO-OPERATIVE MANUFACTORY PROPOSES TO SELL STOCK TO NON-RETAILERS.

The Empire State Drug Company, a retail druggists' co-operative manufacturing establishment, located at Buffalo, N. Y., has submitted a proposition to its members to sell nearly half its stock to persons who are not retail druggists and to sell its goods to non-members subject only to a contract to maintain prices. Many druggists view the new plan with apprehension. They do not see what is to hinder the proprietors of a department store or a firm of rival manufacturers from securing stockholders' privileges and then throwing the organization into the courts on some trumped up charge or other. At any rate the reason given by the directors of the concern, that it is necessary to make such a change, owing to the present business depression, would seem to be a practical confession that the organization has not thus far been a money-making institution. Here is the letter sent to the members with a blank form for them to sign if they would, authorizing the change:

Dear Sir: The Empire State Drug Company has now a manufacturing plant in operation which is capable of manufacturing a much larger quantity of products than can be purchased and made use of by its stockholders. By the agreement under which the stock has been taken, it was provided that sales could be made only to stockholders, it being expected that a sufficient number of stockholders who are retail druggists would be readily obtained to take the entire output of the company. From a variety of causes, chief of which is probably the depressed state of business, our expectations in this respect have not been realized. After a full consultation among the directors and with such stockholders as could be reached, it has been thought advisable to rescind that portion of the original contract containing the restrictions with regard to a portion of the stock and persons to whom sales can be made, and to permit sales of the stock to be made to persons not druggists up to twenty-two thousand five hundred dollars ($22,500), which is $2,500 less than half the stock; and to permit sales of merchandise to be made to non-stockholders under certain restrictions as to their observing the prices fixed by the Board of Directors, the same as stockholders are required to do. It is believed that by this arrangement stock may be sold to persons who are not retail druggists to an amount which will enable the company to carry on its manufacturing business upon a scale large enough to make it profitable, and thereby give the stock value, and at the same time, by removing the restriction of sales only to stockholders, to find a market for its entire output.

Under the existing conditions of business it is thought advisable and probably necessary to make these changes in order to make the operations of the company immediately successful and profitable.

We submit herewith a contract drawn upon these lines. If you think the change desirable, will you please sign the new contract and return it to the office of the company, so that these changes may be put in operation without delay. We remain yours very truly,

C. O. RANO, Secretary.

The proposed change was a surprise to many for the reason that only a few weeks ago the officers of the company had sent out a typewritten circular headed: "We Are the True Friends of the Drug Trade," and offering to fill orders for the following goods with fourteen bottles to the dozen during the month of March: Thomas' Sarsaparilla, $5.50; Ellis' Sarsaparilla, $4.50; Roberts' Compound Syrup of Sarsaparilla, with Iodide of Potassium, Stillingia and Burdock, $3; Phillips' Celery Specific, $5.75; Mrs. Fowler's Special Compound for Women, $5.50, and Empire Headache Konseals, $1.25. The circular closed with the promise, "Within a few weeks we will be able to offer full lines of all the standard pharmacal products of our own manufacture, as well as many specialties of great value, which will be fully described in our price list and catalogue and mailed to our stockholders, at prices way below what we have been paying and every article of a guaranteed strength."

There have been complaints that goods ordered in a hurry have been delayed fully a month before being shipped, which would seem to indicate either a crush of orders or poor management somewhere.

Organizer of the Druggists' Alliance.

J. D. Russell.

This is J. D. Russell, of the Druggists' Alliance of America. He was selling plasters in the Metropolitan district last November, and, while in the store of a prospective customer, he overheard the threats of an angry woman who thought a mistake had been made in filling her order for medicine. The woman was going to ruin the druggist by suing him for $5,000 damages. Russell was led to realize how much bother one angry woman may be to a druggist, and it also occurred to him as barely possible that a deserving druggist of limited capital might actually be ruined by some unfortunate mistake made behind his prescription counter if a clever lawyer should bring suit against him. Then occurred to him in all its attractiveness the idea of a druggists' protective alliance to defend any member in case of a lawsuit, and to pay the damages should the suit go against the druggist. He spoke to several of his customers about it, and the result was that at last he was unable to talk about anything else and resigned his position as a traveling salesman to push the scheme. In spite of discouragements and interruptions the alliance was finally organized March 16, in the Tract Society Building, with R. H. Luthin as president, J. D. Russell, secretary, and a membership roll of 144 names, which goes to show that the scolding of a woman sometimes produces remarkable results.

Mr. Russell is about thirty-seven years of age. He was born in California, the son of a gold-seeker, who died, leaving him to the care of the Franciscan Home in Los Angeles. At the age of ten years he took his fortune into his own hands and was so lucky as to secure the interest of Senator Eugene Casserly, of California, who brought him East and got him a position as a page in Congress. He never saw the inside of a school, but picked up such education as he has chiefly in newspaper offices to which his acquaintance with public men naturally led him. He afterward became well known to the drug trade as a salesman for Seabury & Johnson, whom he represented both in the metropolitan district and also in the Central States, with headquarters in Detroit. Since leaving their employ he has represented several houses. He is a man of considerable talent, but, as he admits himself, he is inclined to work spasmodically. He is now employed as a salesman for the J. Elwood Lee Company.

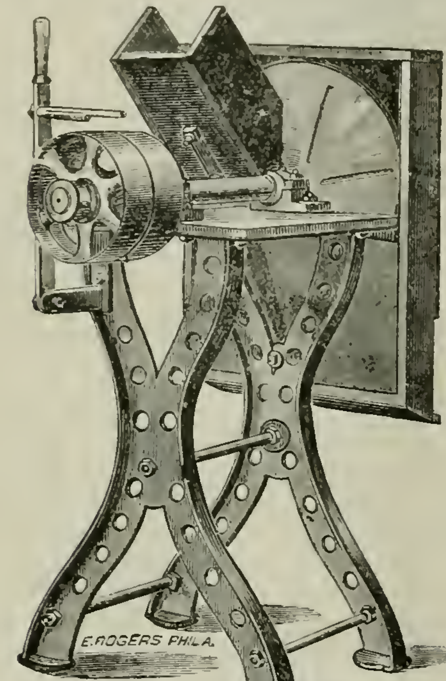
Albert Schurr, of Newark, one of the trustees of the alliance, said to a representative of this paper that the success or failure of the scheme depended, in his opinion, on Russell's talents and perseverance. Otherwise there is little probability of maintaining a flourishing organization.

German Apothecaries Favor the Brush Bill.

At a special meeting of the German Apothecaries' Society on April 5 it was voted to support the Brush bill amending the Greater New York charter instead of the Perkins bill. The Brush bill has the support of the New York College of Pharmacy, and calls for five members to the Greater New York Board of Pharmacy, two to be appointed by the New York College of Pharmacy, two by the Kings County Pharmaceutical Society and one by the German Apothecaries' Society. The entire proceeds of registration fees under the Brush amendment are to be given unreservedly to the New York College of Pharmacy. The Perkins bill divides the proceeds of re-registration between the New York College of Pharmacy and the Brooklyn College of Pharmacy. There is a good deal of excitement in German circles over this action, because at a previous meeting of the society it was voted to support the Perkins bill.

THE MANUFACTURE OF MEDICATED SOAPS.

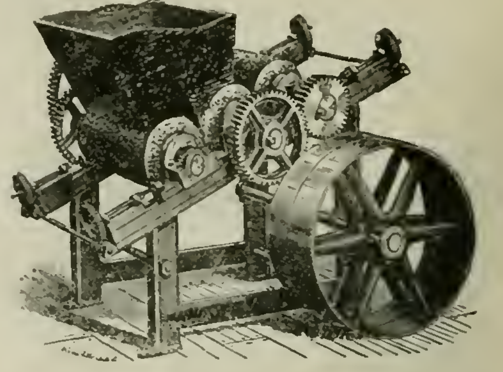
The degree of civilization of a nation may almost be determined by the quantity of soap it consumes. But soap has had accorded to it another function than merely its cleansing property, it has come to be recognized as a most important remedial agent, and in modern therapy soap in its many medicinal combinations occupies a position of insistent prominence. Unna & Eichhoff have been particularly industrious and thorough in investigating the possibilities of soap as a medicinal agent, and their labors have been added to by many other observers and experimenters, till there has been developed, in dermo-therapeutics especially, a distinct province for soap and its combinations with various medicaments. A medicinal soap, properly applied, often is an invaluable aid in combating a skin eruption, cleansing and healing a foul ulcer, and stimulating and assisting regenerative processes. The physician and the pharmacist of to-day who are not fairly posted regarding medicated soap, can well be said to be behind the times. The former is expected to have a more particular and special knowledge, but the latter in a general way must know the list of combinations, the classes of diseases in which each is of best service, and be able to give his customers general information and directions for their use. But neither doctor nor druggist is a practical soapmaker, consequently knows little of the process for the manufacture of medicated soaps. They may therefore value a little information in this direction, gathered during a visit to the manufacturing laboratory of Schieffelin & Co., New York. In a general way, the course of operations is as follows:


E. ROGERS PHILA.

Automatic Soap Chipper.

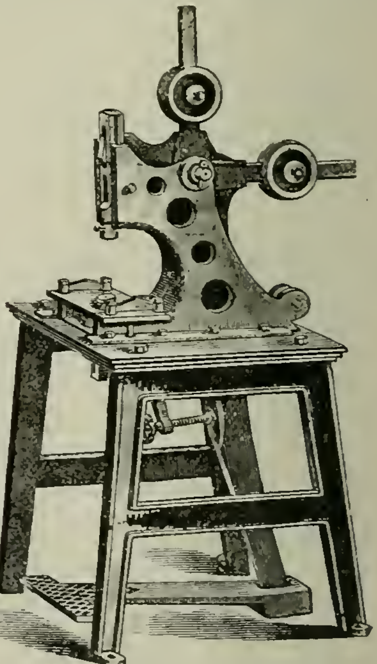
To make a properly medicated soap involves a series of operations—mostly mechanical—and the process is far more complicated than might be supposed, involving no less than nine steps. To begin with, a pure white tallow soap is chipped into thin shavings in a chipper, which is a revolving disk in which are inserted knife blades like a plane.

The soap is then neutralized in an earthenware vessel, capable of holding 100 gallons, and heated by steam. The method of neutralization is a very delicate one and requires two further operations aided by machinery for stirring and handling the soap. After being dried on a series of racks in the air and in a room heated by steam coils, the soap is run once through the mill, which is an improved machine of great strength, with gigantic rollers accurately fitted against each other, the first revolving at a lower speed than the second, and the second slower than the third, so that a rubbing as well as a crushing action is obtained, and the faster roller takes the soap in the form of a ribbon from the slower. Finally, the third roller is deprived of the ribbon of soap by a comb and knife blade, taking it in the form of long, thin, homogenous strips. The soap is then weighed and the exact amount of medicament is added, and it is put through the mill five times, which makes a total rolling and rubbing between the granite rollers of ten times. The incorporation of the medicament is then complete and the ribbons of soap are ready to be pressed and stamped.



Toilet Soap Mill.

The operation of pressing is accomplished by means of the plodder, a heavy machine of iron, which squeezes the soap into a long bar, after the manner of a sausage machine. The bar is then cut into equal cakes which are stamped on a foot press, which in the hands of a skilled workman does smooth and rapid work. These operations are carried on in a room 50 x 30 feet, and the six pieces of machinery are driven by power from an elec-



Stamping Press.

tric motor. The wrapping and packing are done by girls and on the labels are stated the surgical uses of the soap. This, in brief, is all there is to the manufacture of medicated soaps, from a mechanical standpoint, but the study of the proper combinations and the chemistry of the processes constitutes almost a separate science.

The number of medicaments used by dermatologists in the soap form is large, and there is a demand for soaps containing the following ingredients, and in about the proportions named: Aristol, 2 per cent.; Benzoin, 5 per cent.; Birch Tar, 10 per cent.; Borax, 10 per cent.; Europhen, 2 per cent.; Ichthyol, 5 per cent.; Naphthol, 3 per cent.; Sand 30 per cent.; Sublimate 0.5 per cent.; Sulphur, 10 per cent.; Thymol, 2 per cent.; Resorcin, 5 per cent.; Boracic Acid, 5 per cent.; Birch Tar and Sulphur; Naphthol and Sulphur; Creolin, 10 per cent.; Eucalyptol, 5 per cent.

In making these soaps it is absolutely necessary to have the basic soap devoid of free alkali. To illustrate this point, some cakes of sublimate soap were shown which had been made from a soap not properly neutralized and which had assumed a dark greenish color due to the decomposition of the sublimate. From this it follows that a correctly made sublimate soap should not be green, for that would indicate either that the sublimate had decomposed or that the maker of the soap expected that it would decompose and, therefore, colored the soap green in anticipation to conceal subsequent change in color.

MANUFACTURE OF ALBUMEN AT CHINKIANG.

An enterprising German firm has undertaken the manufacture of albumen at Chinkiang, China, it having been found that this place offered the best field for the business on account of the cheapness and plentiful supply of eggs. The factory is now successfully established, with possibilities of conducting it on a much larger scale. United States Consul A. C. Jones, at Chinkiang, reports that the country surrounding Chinkiang has always been noted for the raising of ducks and other domestic fowls, and much attention is given by the farmers to this industry. It is not an unusual thing for a farmer to have four and five thousand ducks under his care, and they may be encountered any day in a walk of a mile or two, marshaling their ducks in battalions of well-drilled ranks to graze on the luxuriant grasses of the neighboring hills or to swim in the numerous ponds and water courses.

In China the duck is a fine, large, hardy bird, a prolific layer, and requiring little attention and less expense, as she can readily find her food for herself. The egg of of the duck is preserved by the Chinese by a process which will keep them when so preserved ten and twenty years. It is a favorite food of the people, especially of the higher classes, and is to be met with at all their dinners and entertainments. Ducks are sold in the market for about 30 cents (Mexican) a pair and the eggs at about 6 cents a dozen.

The establishment of this albumen factory has made a good market for the eggs and the country people bring them in by thousands. The factory uses duck eggs in the manufacture of albumen in preference to chicken eggs, solely on account of their greater cheapness. They are bought, not by the dozen, but by the thousand, the factory paying an average of $8 (Mexican) per thousand. The process of the manufacture of albumen is by no means new, but has not heretofore been a financial success, owing to inability to utilize the yolk as well as the white of the egg. This difficulty has now been successfully overcome. As the present capacity of this factory is forty thousand eggs per day, with an early prospect of a considerable increase on the introduction of machinery, it may be assumed that the farmers are greatly benefited by the establishment of this new industry.

As soon as the eggs are received at the factory they are tested by a very simple but ingenious process. They are held in pairs in front of a circular opening in a tin cylinder open at the top, containing a lamp giving a powerful light, which is concentrated on the opening. Every speck and flaw in the egg is distinctly seen in this process and all eggs showing the slightest sign of defect are at once rejected. The percentage of rejected eggs is remarkably small, rarely amounting to fifty per thousand. the good eggs are sent to the rooms prepared to receive them, where a number of Chinese girls are employed to break them and to separate the yolk from the white, placing each into separate vessels. The white then undergoes one of two processes; it is either carefully cleaned of all stray clots of yolk and then put through a course of stirring in a large vessel by means of a heavy rod or paddle worked by hand, when it is ready for the drying room; or, after being cleaned, it is run into large vats and allowed to ferment, the process of fermentation being accelerated by the admixture of certain chemicals, which chemicals, by the way, are held by the firm as a secret. When it is found in drawing off that all impurities have either been deposited or thrown off in the form of a thick froth, and the resulting liquid is albumen, as clear as water, the albumen is ready for the final process of drying. This is performed in a series of three rooms, each hotter than the last, the temperature ranging from 40 to 50 degrees Centigrade. The albumen is run into shallow tin pans about 1 foot square, which are placed in ranges of shelves in the drying rooms. Frequent examinations are made to see that the temperature is maintained, and that the process of drying is sufficiently gradual, uniform and complete, a period of sixty to seventy hours being found necessary for that purpose. When thoroughly dry the albumen, which now presents the appearance of isinglass with a yellow tinge, is, after cooling, placed in large, square packing boxes, lined with tin, holding about 400 pounds each, and is ready for shipment.

The principal use for albumen is in the preparation of fast dyes for superior kinds of cotton goods, and it is shipped to England, Germany and France.

An inferior kind of albumen, I am informed, is manufactured in the United States from bullock's blood and used for inferior goods.

The yolk of the eggs, after separation from the white, is passed through two sieves—one coarse and one fine—and is then run off into vessels holding about 20 pounds each, in the form of a yellow, even-running liquid of the consistency of rich cream. It is then poured into vats holding about 100 pounds, and a 10 per cent. solution of salt, borax, and an unrevealed chemical is then added for the purpose of preservation. The mixture is thoroughly stirred until it assumes the consistency of thick molasses and of a dark orange color, and is then poured, or, rather forced, through a funnel into a cask holding about 500 pounds net. It is then ready for shipment. This is used in the preparation and dressing of superior leather goods, and is in much demand in England, Germany and France.

No use has yet been found for the empty egg shells, and they are thrown away.

HAEMOL-IODIDE.—A brown powder, which is not absorbed until it reaches the duodenum. It contains 16.6 per cent. of iodine, which is chiefly chemically combined. The action of hæmol iodide on the system is not more effectual than that of potassium iodide, but more prolonged.

LECITHIN (Disteanin - glycerin - phosphoric - cholinester).—A white waxy-like mass, soluble in alcohol, ether and chloroform; when mixed with water and saline solutions lecithin swells up to a gelatinous mass without dissolving. Lecithin is well known to be the most important phosphorized constituent of the nerve tissue, and is widely distributed throughout the plant kingdom.

A Drying-Box for Pills, Etc.

Working in Calcutta for many months in the year with air fairly well saturated with moisture, it is necessarily a matter of difficulty to dry preparations by exposure to air. A teak-wood box was accordingly constructed, lined with tin, and fitted with two lids, the inner one being coated along its sides with felt and resting on ledges similarly fitted, like the inner lid of an ice chest. At the bottom of the box a movable tin tray was placed, which contained a charge of about 25 pounds well-burned lime in small lumps, the substances to be dried being placed in perforated zinc trays, supported by battens over the lime.

A desiccating material is perhaps better adapted for drying pills, even when volatile oils are absent, than a current of warm air. If heat be employed the pill is heated throughout, and there is a tendency for the mass to become uniformly hard. When a drying agent, however, such as lime, is used, it is probable that as the surface is first desiccated, and becomes hard, moisture from the interior of the pill is with difficulty expelled, and a more easily soluble pill is the result.

Obviously for pills containing volatile oils, etc., the drying box is incomparably superior to desiccation by exposure to air. In drying pills containing camphor or volatile oils in the drying box the following expedients might also be advantageously adopted to still further save loss from volatilization. Place in the drying box a shallow dish containing the volatile oil, etc., present in the pill. The air span of the drying box would consequently be rapidly saturated by the easy evaporation of this oil, etc., and loss from the pill mass checked. (C. J. H. Warden, in Ph. Jr.)

*Note on a Sample of Scammony.**

By I. W. THOMSON.

Some time ago a parcel was handed to me marked "Scammonium," accompanied by a statement that it contained 84.864 per cent. of scammonin, and, that there might be no mistake, gave the chemical formula, which is generally accepted as representing that body, $C_{32}H_{56}O_{16}$. It was said to be of German origin. A very cursory examination of the sample so completely belied its certificate of character that I concluded it could hardly claim more than a very remote relationship with scammony. I submit the result of my examination of it.

The sample consists of irregular broken pieces, apparently portions of a cake, about half an inch in thickness, greenish-black, hard and horny, breaking with a resinous fracture, and very difficult to powder. On submitting it to a systematic examination the following results were obtained:

	Per cent.
Soluble in ether	0.4
Soluble in alcohol	2.0
Soluble in water	42.6
Starch and a little cellular tissue	43.0
Moisture	12.0
	100.0

It yielded 2.12 per cent. of ash, of which 0.93, equal to 43.6 per cent., was soluble in water. The ash contained K, Mg, Ca, Fe, and Si, as carbonate, sulphate, and a trace of chloride.

The water-soluble portion was evidently gum, apparently gum arabic. The insoluble portion consisted very largely of starch, with a small quantity of cellular tissue. So far as I know the specimen is unique, and the Germans must think us very gullible when they attempt to foist such an article upon us as scammony.

HAEMOL-BROMIDE.—This compound of hæmol contains only 2.7 per cent. of bromine, which is in a state of organic combination, and is so slowly diffused through the system that long continued doses of 1 to 2 gm. do not occasion any symptoms of bromism.

PHARMACY.

ARTIFICIAL GLYCERIN.—The following artificial substitutes have been reported in the European market: 1. A solution of calcium chloride and glucose. 2. A solution of calcium chloride and magnesium chloride. 3. A solution of calcium chloride in water.

PAPAW MILK POWDER is obtained from the papay melon, or carica papaya by scarifying the melon and collecting the juice, which runs in pans. The juice is then taken from the pans, laid on flat surfaces in the sunlight until the moisture is evaporated, when it is passed through a sieve for the removal of mechanical impurities. In this condition, says General Appraiser Wilkinson, of this port, it is packed in tins and exported (imported), to be manufactured into various medicinal preparations, such as papoid, papaine, papayotine, carica papaya, caroid and other forms of vegetable pepsin.

ERYTHROL-TETRA-NITRATE.—According to E. Merck this is a nitrated product of the tetra-atomic alcohol erythrit ($C_4H_{10}O_4$), a derivative of erythrin, which occurs in many lichens, such as the Rocella family. This nitrated product forms large scales, which are insoluble in water, readily in alcohol, melt at 61° C., and like nitro-glycerin, explodes readily when struck or rapidly heated. Medicinally, erythrol nitrate is employed like amyl nitrite, or nitro-glycerin, also because of its explosive properties care must be exercised in handling. Given in tablets, each containing 0.03 gm. of the substance, one to two of these constituting a dose, which may be repeated after four to six hours.

THE INDIA RUBBER INDUSTRY.—R. Robine (in Rev. Chim. Ind., Jr. Soc. Chem. Ind.) says that the best qualities of india rubber are still those collected in the districts surrounding the River Amazon. But with the rapidly increasing demand, African and Asiatic brands entered the market. Para rubber maintains its reputation as the highest quality among the different brands. Its loss in washing is from 10 to 16 per cent. Negrohead loses from 25 to 35 per cent. Matto Grosso, which approaches Para in purity, loses only about 10 per cent. in washing. Pernambuco, Maranham, and Bahia lose from 30 to 40 per cent. Ceara, a very good brand, loses about 20 per cent. The losses on purifying the African qualities are generally considerably higher. The Asiatic brands, which at one time used to be of high quality and very plentiful, have of late years deteriorated in quality and suffered a considerable reduction in quantity, owing to the reckless methods adopted for their collection. The purification of the crude india-rubber is effected by first treating it in hot water for from twelve to twenty-four hours, then cutting it into slices, which are subjected to a repeated passage between friction rollers upon which a supply water is flowing. The honeycombed sheets thus obtained are dried in a hot-air stove. The dry sheets are then given solidity and homogeneity by treatment in the masticator or between a horizontal pair of steam-heated friction rollers. Continuous rubber sheets may be obtained by three different methods, and are accordingly described as cut sheets, rolled sheets and spread sheets respectively. India rubber tubing is produced by pressing the india-rubber through a nozzle, in the center of which a fixed core is arranged. The tubes so produced are laid in flat spirals on chalk beds, and are in this state vulcanized. India rubber threads, of square cross-section are manufactured by cutting india rubber sheets by means of suitable cutting machines. Threads of circular cross-section are obtained by pressing india rubber sheets, or dough, into suitable moulds which are heated to the required temperature. India rubber toy balls are pro-

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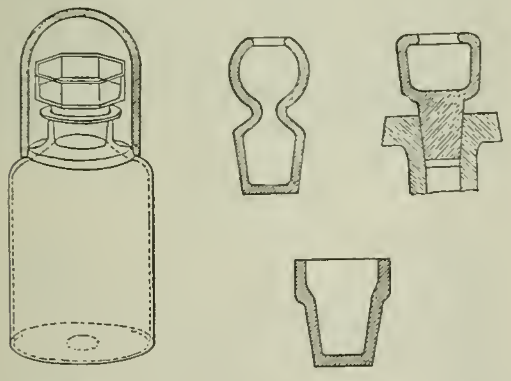
*Read at a Meeting of the Pharmaceutical Society of Great Britian, held in Edinburgh. Reprinted from Ph. Jr.

duced by cutting india rubber sheets into spherical segments, which are cemented together with india rubber solution. Before finally closing the body so formed, a small quantity of ammonium carbonate is introduced into it, and the opening closed with a small disc of india rubber. The body thus formed is placed in a mould and gently heated, whereupon the dissociating ammonium carbonate distends the ball. India rubber belting is obtained by coating stout cotton cloth on both sides with india rubber solution. Several of these fabrics are then united by pressure, and subsequently the whole is covered over with india rubber sheets. Insulated electric cables are manufactured by india rubber tape wound round the strands to be insulated. These tapes are held in position by similar strips of cotton cloth lapped on in the opposite direction. The cables are then vulcanized in a closed vulcanizer. The manufacture of pneumatic tires is carried out by cutting strips of india rubber sheet of a length corresponding to the circumference of the wheels, but successively decreasing in width. These strips are then, in the order of their widths, cemented one upon the other, so that the central longitudinal axis of the first forms also the axis of the whole fabric. The whole is then steam vulcanized. The ends of the band so obtained are then joined together. For the purpose of vulcanization, from 7 to 15 per cent. of sulphur are generally used, but only from 1 to 2 per cent. combine with the india rubber. The different vulcanization processes employed are: (1) Vulcanization in a bath of molten sulphur. (2) Steam vulcanization. (3) Dry heat vulcanization. (4) Cold vulcanization. (5) Vapor vulcanization. The first of these processes is practically obsolete; the second is largely employed for the vulcanization of india rubber goods of various descriptions; the third process is extensively used, especially for the vulcanization of waterproof cloth.. The temperature in these processes is 170° C. The fourth of the above processes is chiefly used for the vulcanization of waterproof cloth and of thin india rubber sheets. The process is carried out by treating the articles to be vulcanized with a solution of sulphur monochloride in carbon disulphide or benzine. In the fifth process, the goods to be vulcanized are exposed to the vapor of sulphur monochloride, either by itself or in conjunction with gaseous nitric acid, or nitric or nitrous oxide.



CONTAINER STOPPERS FOR HYGROSCOPIC LIQUIDS OR POWDERS.—This patented stopper is, as shown in the figure, hollow inside, serving as a receptacle for such desiccants as caustic potassa, calcium chloride, phosphoric oxide, etc.; when placed in the neck of the bottle the stopper is covered with a closely fitting cap. This arrangement is adapted for all hygroscopic liquids or deliquescent salts, also for preserving fluids which give off unpleasant odors or fumes in moist air, such as butyric acid, valeric acid, bromine, fuming nitric acid, acid chlorides, phosphoric oxide, chlorides of phosphorus, etc.

QUESTION BOX

The object of this department is to furnish our subscribers with reliable and tried formulas and to discuss questions relating to practical pharmacy, prescription work, dispensing difficulties, etc. Requests for information are not acknowledged by mail and ANONYMOUS COMMUNICATIONS RECEIVE NO ATTENTION.

Manufacturers of Wax Models.

(J. K.) Address J. R. Palmenberg's Sons, 713 Broadway, this city.

To Keep Wood from Warping.

(F. B. N.) A formula for a preparation of this character was given in reply to your former query (Waterproofing Veneers), this journal, Feb. 18, 1897, page 205. To prevent moisture from penetrating wood soak the wood with linseed oil. A uniform layer of linseed oil is applied, and as soon as the first coat has become thoroughly dry the second coat is laid on.

Cannabis Indica in Aqueous Mixtures.

(G. R. P.) Extract of cannabis indica is practically insoluble in aqueous mixtures, and the precipitation of the resin cannot be wholly avoided. The National Formulary gives an approved formula for compound mixture of chloral and potassium bromide, in which the difficulty is somewhat overcome by the use of tincture of quillaja, which holds the resin in suspension.

Tanners' Oil.

(J. C.) Tanners' oil is a name formerly applied to the oil obtained from the livers of the codfish by boiling after that portion of the oil suitable for medicinal purposes has been removed. Other oils are extensively used by tanners and curriers in the manufacture of leather, such as the oils of various kinds of fish, the seal, shark, whale, etc. Train oil is a term sometimes applied to whale oil, but under it are also included oils from the seal, cod, shark, and other fish of a like nature.

Ichthyol.

(C.) Ichthyol as a therapeutic agent was brought to the attention of the medical fraternity by Dr. P. G. Unna, Director of the Dermatologic Hospital at Hamburg (Monatshefte für praktische Dermatologie, 1882, 328). It is prepared from a peculiar mineral oil obtained from certain fossil deposits found in the Tyrol, supposed to be derived principally from fish—whence its name. It is not manufactured in this country, though the process is covered by U. S. patent No. 318,662, dated May 26, 1885. We are unable to give statistics showing the quantities imported. It is dutiable as a medicinal preparation under paragraph 60 of the present tariff act, i. e., 25 per cent. ad valorem.

Extract Vanilla.

(H. W. S.) The Era Formulary is authority for these: (1). Vanilla, good quality, 1 ounce, cut into small pieces and triturate with 2 ounces of coarse granulated sugar. Place in a percolator and throw on dilute alcohol until a pint of tincture has passed; add this to 1 pint simple syrup and mix.

(2). Take 1 pound of vanilla beans, long, of good flavor, cut into small pieces and bruise in a mortar; macerate the same in one pint of diluted alcohol, shaking occasionally for two weeks; then transfer to a percolator, and add gradually sufficient dilute alcohol to make two pints of finished extract. Caramel may be used for coloring liquids of this character a deep brown.

Stomach Bitters.

(G. R. P.) See formulas in this journal, Dec. 10, 1896, page 761. Here are two others:

(1). Comminute ½ ounce each of speedwell, mint, balm, wormwood, arum root, zedoary, calamus root, small pomegranates, caraway seed and cinnamon. Pour over them 1¾ quarts whiskey and macerate the mixture for ten days in a warm place, with frequent shakings in the meantime. Then press the liquor out, filter, and put it in bottles.

(2). Dissolve 60 drops of oil of orange peel, 40 each of oils of calamus, angelica, cardamom, wormwood, ginger and marjoram, and 2 fluid drams of essence of cognac in 1¾ gallons of rectified spirit; sweeten the solution with 5½ pounds of sugar dissolved in 1½ gallons of water, and filter.

Repolishing Magnifying Glasses

(S. W. F.) In the process of manufacture lenses are polished by means of rouge in molds of pitch or on a cloth. This work is always done by experienced workmen, and it is almost useless for an inexperienced person to attempt to polish a lens without doing it injury. Lenses may be cleaned, however, with a very soft chamois, or, if greasy, they may be wiped with a little tissue paper wet with weak alkali. This treatment should be pursued as rarely as possible. Sometimes photographic lenses are polished with a paste made of putty powder, or very fine rouge and water, and then rubbing briskly with the point of the finger or side of the hand. Whether you can pursue a similar course with the lens of your instrument is a question. Rouge for polishing may be obtained from almost any jeweler or dealer in mathematical instruments.

Extract of Strawberry.

(H. W. S.) (1) Bruise 4½ pounds of strawberries; pour 3 quarts of alcohol over the mass; let it stand for some time and filter. The product will make about a gallon of the extract.

(2) Butyric ether	4 ounces
Acetate of amyl	2 ounces
Formic ether	1 dram
Aldehyde	1 dram
Extract of orris	8 ounces
Oil of rose	5 drops
Oenanthic ether	1 ounce
Glycerin	4 ounces
Cologne spirit	48 ounces
Water	16 ounces
Solution of cochineal, q. s.	
Caramel, q. s.	

Mix the water and glycerin, and to the mixture add enough solution of cochineal and caramel to give the color desired. In the alcohol dissolve the other ingredients, and mix with the aqueous solution first made.

Copying Inks for Use with Gelatine Pad.

Blue.

(S. W. T.) Heat in a suitable vessel, with constant stirring, 10 parts by weight of aniline blue, soluble in water, 10 of glycerin, and 50 to 100 of water. Solution takes place immediately, and, according to the quantity of water used, an ink is obtained which permits the taking of a smaller or larger number of copies. On account of its fluidity, says Lehner, the finest pen drawings may be executed with this ink, and copies of them taken by means of the hektograph.

Methyl Violet.

Methyl violet 10 parts by weight, dilute acetic acid 5, alcohol (90 per cent.) 10, water 10, glycerin 5. Heat the ingredients in a glass flask to from 122° to 140° F. for two hours, and then filter the solution through flannel.

Red.

Diamond fuchsine 10 parts, alcohol 10 parts, glycerin 10 parts, water 50 parts.

Green.

Aniline blue, soluble in water, 10 parts; picric acid, 10 parts; alcohol (90 per cent.), 30 parts; glycerin, 10 parts; water, 30 parts.

Ordinary ink may be made into a copying ink by the addition of some hygroscopic substance, such as sugar, dextrin, grape sugar (glucose), or small quantities of calcium chloride. Two formulas for inks of this character were published in this journal, Aug. 27, 1896, p. 276. See also this journal, March 11, 1897, page 304.

Eye Remedies.

(J. K.)

Salve.

(1) Yellow mercuric oxide	15 grains
Petrolatum	2 ounces

Cold cream may be substituted for the petrolatum.

(2) Morphine sulphate	1½ grains
Benzoic acid	4 grains
Ammoniated mercury	48 grains
Zinc oxide	64 grains
White wax	64 grains
Spermaceti	192 grains
Olive oil	512 grains
Oil rosemary	1 drop

Eye Lotion.

(1) Boric acid	12 grains
Camphor water	3 ounces

Mix and filter.

(2) Wine of opium	2 drams
Zinc sulphate	20 grains
Distilled water	½ pint

Mackenzie's Lotion.

(3) Corrosive sublimate	1 grain
Ammonium chloride	6 grains
Cochineal	1½ grains
Alcohol	1 fl. dram
Water	8 fl. ounces

Mix, allow to stand twelve hours, and filter.

Powdered Magnesium and Aluminum for Flash Lights.

(W. J. H.) The magnesium and aluminum powders directed in the formulas for flash-light powders, this journal, March 18, 1897, page 333, are not powdered salts of these metals, as you suppose, but they are the metals reduced to the powdered state. When heated in the air magnesium takes fire and burns with a dazzling white light, which is very rich in actinic or chemically active rays. On account of this property it is employed in photography, for signalling purposes, and in pyrotechny. Powdered aluminum possesses similar properties, and it is said (Woodbury) to give a more brilliant light than magnesium, and to be free from the obnoxious vapors usually produced. He gives this formula: Powdered aluminum, 30 parts; potassium chlorate, 70 parts. After mixing, the compound should be handled carefully, as there is always danger of explosion. The aluminum powder should be heated to drive away all greasy matters. A compound containing both magnesium and aluminum is this one: Potassium chlorate, 70 parts; potassium perchlorate, 40 parts; magnesium, 45 parts; aluminum, 20 parts. Powder each separately and, after careful admixture, make up into small cartridges. A small tuft of gun cotton is placed at the bottom, and acts as a fuse.

Grafting Salve (Wax).

(L. M. R.)

(1) Pine resin	50 parts
Tallow	10 parts
Turpentine	5 parts
Alcohol, 90%	5 parts

The resin is melted in an iron vessel. The turpentine is added, next the tallow, and finally the 90 per cent. alcohol. Stir the ingredients thoroughly and cool.

(2) Pitch	4 ounces
Resin	4 ounces
Lard	2 ounces
Beeswax	2 ounces

Melt over a slow fire.

(3) A good grafting wax can be made by melting together 50 pounds resin, 10 pounds beeswax, and 1 gallon raw linseed oil. As soon as the resin and the wax are melted, dip one pint at a time into a bucket of cold water, keeping it away from the bucket with a stick. As soon as it is cool enough stretch with slightly greased hands. If the wax is to be used in very warm weather, a little less oil and beeswax will be better.

The Scientific American Cyclopedia of Receipts is authority for the following formula for a liquid grafting composition:

(4) Melt 1 pound resin with 1 pound tallow, and, when mixed remove from the stove and allow it to cool until a scum begins to form. Then add a teaspoonful of turpentine. Replace on the stove, and add 7 ounces of a mixture of 2 parts alcohol and 1 part water, stirring briskly, and taking care that the alcohol does not burn, as it will if too hot. Stir till of the consistence of honey, keep corked, and apply with a brush. If it gets too hard, remelt, and apply a few drops of turpentine and alcohol and water. It hardens after applying.

Remedies for Dandruff.

(J. K.) A good deal in the way of preventive treatment of dandruff can be accomplished by the proper care of the scalp and of the general health, and the nearer the body can be kept to the standard of health by means of bathing, exercise and good diet, the less likely is dandruff to develop. It is important, too, that local measures be supplemented, in the majority of instances, by internal treatment to render the cure permanent. This treatment must be along the lines marked out by a competent physician, whom you should consult. Following are some formulas for local application:

(1)	Resorcin	5 to 10 parts
	Castor oil	45 parts
	Alcohol	150 parts
	Balsam of Peru	0.5 part

Rub in daily with a piece of flannel.

(2)	Eau de cologne	1 dram
	Sulphurous acid	2 drams
	Glycerin	1 ounce
	Distilled water	4 ounces

Brush into the hair each day.

(3)	Caustic potash	8 grains
	Phenic acid	24 grains
	Lanolin	4 drams
	Cocoanut oil	4 drams

Rub into the scalp morning and evening.

(4)	Balsam Peru	½ dram
	B-naphthol	1 dram
	Lanolin	6 drams
	Benzoated lard	2 drams

(5) The head should be first well washed with hot water and alcohol soap. Alcohol soap consists of 2 ounces of soft soap (made from olive oil), ½ ounce alcohol and 10 minims oil of lavender. The soap is afterward washed away with plenty of hot water and the head thoroughly dried with a warm cloth. Then thoroughly and firmly rub into the scalp a glycerole of tannin, strength from 10 to 30 grains to the ounce, according to the gravity of the case. If the tannin fails, resorcin may be tried. The process should be repeated two or three times a week as required. After total removal of the dandruff apply daily a dressing of carbolic oil containing 1 ounce olive oil, 10 grains of absolute phenol and 1 dram oil of cinnamon, warm together and decant.

Mucilage or Paste for Labels.

(M. V. C.) The Era Formulary gives these:

(1)	Rye flour	4 ounces
	Powdered alum	½ ounce

Rub to a smooth paste with 8 ounces of cold water, strain through a cheese cloth and pour into 1 pint of boiling water. Continue heat until thickened to suit. When nearly cold, add:

Glycerine	1 ounce
Oil of cloves	30 drops

This is suitable for tin or wood boxes, or bottles, and keeps sweet for a long time.

(2)	Gum tragacanth	1 ounce
	Gum arabic	4 ounces
	Dissolve in	
	Water	1 pint
	Strain, and add	
	Thymol	14 grains
	Suspended in	
	Glycerine	4 ounces
	Add water to make	2 pints

This makes a thin paste, suitable for labeling bottles, tin or wooden boxes, or for any other purpose paste is usually called for. It makes a good excipient for pill masses, and does nicely for emulsions, the very small percentage of thymol not being of any consequence. This paste will keep sweet indefinitely, the thymol preventing fermentation. It will, on standing, separate, but a single shake will mix it sufficiently for use.

(3). Postage Stamp Mucilage.

Dissolve 1 pint of gum dextrin in a pint of boiling water, strain through flannel and add 2 ounces of acetic acid. When nearly cold add 4 ounces of alcohol, stir constantly, and finally add enough warm water to make 1 quart.

Standard Adhesive Mucilage.

(4)	Gum arabic in fine powder	8 ounces
	Glucose	2 pounds
	Boiling water	20 fl. ounces
	Acetic acid	1 ounce

Dissolve the gum arabic in the water, then add the glucose, and bring the whole to a good boil, stirring well. Remove from the fire, and, lastly, add the acetic acid.

Wine of Beef and Iron.

(C. S. D.) The National Formulary preparation is a good one. Here are formulas for some others:

(1)	Iron phosphate, U. S. P.	32 grains
	Water	1 fl. ounce
	Syrup	2 fl. ounces
	Tincture fresh orange peel (20%)	1 fl. ounce
	Sherry wine, enough to make	16 fl. ounces
	Hydrated peroxide of iron	2 tr. ounces

Mix the hydrated peroxide of iron with the tincture of orange and sherry wine, and allow to stand twenty-four hours, agitating occasionally. Filter and test for absence of tannin with tincture of ferric chloride. If free from tannin add beef and iron, previously dissolved in prescribed amounts, hot.

(2)	Extract of beef	4 ounces av.
	Phosphate of iron	645 grains
	Stronger white wine	52 fl. ounces
	Syrup	8 fl. ounces
	Tincture of fresh orange peel	8 fl. ounces
	Allspice, powdered	50 grains
	Cloves, powdered	15 grains
	Water, enough to make	5 pints

Dissolve the extract of beef in a part of the water, and the phosphate of iron in the remainder of the water, using heat if necessary. Mix the solutions, add the wine, then the tincture of orange peel and the spices, macerate for four days and filter.

(3)	Extract of beef	256 grains
	Citrate of iron and ammonium	256 grains
	Simple elixir	4 ounces
	Angelica wine, enough to make	1 pint

Dissolve the extract of beef in 8 ounces of the wine, and the citrate of iron and ammonium in a little hot water; mix the solution, add the simple elixir, and finally enough wine to make the whole measure 1 pint. Let the mixture stand a few days, then filter.

(4)	Extract of beef	2 tr. ounces
	Phosphate of iron (soluble scale)	4½ tr. ounces
	Tincture of orange	2 fl. ounces
	Essence of lemon	½ fl. ounce
	Syrup (simple)	26 fl. ounces
	Alcohol	21 fl. ounces
	Hot, water, q. s.	
	Wine (native), to make	128 fl. ounces

Dissolve the extract of beef and the phosphate of iron, each separately, in about 8 ounces or more of hot water. Mix the solutions, and when cold add native wine, tincture of orange and essence of lemon, and filter. To the filtrate add the syrup and alcohol previously mixed.

NEW PRODUCT FOR DENATURING ALCOHOL. —This is the tri-hydrate of ethyl sulphydrate obtained by distilling a concentrated solution of barium sulphide with ethyl sulphovenate. This substance is apparently in no way to be separated from alcohol, when once mixed with it. Five grams of this mixed with 10 per cent. mercaptan will denature a hectoliter of alcohol.—Br. & Col. Dr.

DR. ECCLES AND PASKOLA.

TWO LAWYERS WORRY THE AUTHOR OF AN ALLEGED LIBEL WITH HARD QUESTIONS.

"This is a blackmailing conspiracy to discredit me with the public," exclaimed Dr. Robert G. Eccles, at the close of a three days' examination in the Paskola case before Commissioner C. A. Molloy, at 33 Wall street, New York, on Monday. "I denounce the question just put to me as a discourteous and vile slander."

"Never mind about that," said his inquisitor, General Thomas E. Powell, of Columbus, Ohio; "answer my question."

"No, sir, I did not go to Detroit to learn how to identify Parke, Davis & Co.'s goods in order to recommend them to the United States Indian Commission."

Dr. Eccles was in a fury. He had often been made angry during the exhaustive examination which Dr. W. J. O'Sullivan, the medico-legal expert, had given him, but never before had he turned pale and shown such excitement as he did now.

"I want to go on record," continued the witness, "that when my articles exposing Paskola were first published, Mr. Russell called upon me at my home in Brooklyn, and threatened to bring up this very matter against me, and I defied him."

Such was the climax of an examination which had been full of sensational features. It began on Friday at 11 o'clock, when Dr. O'Sullivan tried to find out, as he himself put it, how much Dr. Eccles knew about medicine. The result, as expressed by Dr. O'Sullivan to the witness, was that he discovered that Dr. Eccles had at all events a forensic mind.

The examination was conducted at the office of McCarthy & Baldwin, at a long table, around which were grouped the parties interested. Besides those already named there were Frederick S. Waite, of New York, counsel for Scott & Bowne; Charles Case, of Ohio, and Dr. F. B. McNeal, formerly Food Commissioner of Ohio, one of the defendants. Joseph H. Choate, personal counsel for Mr. Bowne, who had appeared at previous examinations, was not present.

At the beginning Mr. Case had objected to Dr. Eccles being examined as a witness, on the ground that he was named as one of the defendants in the Ohio suit. General Powell, on the other hand, denied that Dr. Eccles was really a defendant, since he had not been served with any papers in the case. "And I may state now," said the General, "that he will not be made a party to the case unless he voluntarily appears. We don't care anything about him."

W. J. O'Sullivan.

Commissioner Molloy finally decided that Dr. Eccles' examination might go on, since a person is not a party to a suit until served with papers.

In answer to questions by Dr. O'Sullivan, Dr. Eccles gave as his vocation that of physician and editor. He said he had been educated at the Long Island College Hospital, where he graduated with the degree of M. D., in 1881. He said that away back in 1865 or 1866 he had pursued an independent course in chemistry in Glasgow, under the tutorage of Professor Ramsay, now of the university of that place. Besides the degree of M. D., he had had the degree of Ph. G. conferred upon him by the Brooklyn College of Pharmacy, of which he was at one time dean.

In answer to questions he gave a long list of scientific, medical and pharmaceutical societies of which he was a member. Among them he mentioned the Kings County Pharmaceutical Society, and on Dr. O'Sullivan's inquiring whether he was at present a member of that society, he replied that he was not. He testified that he practiced medicine in Brooklyn, and had a chemical laboratory at his home, No. 191 Dean street, at which he had been accustomed to work a portion of each day until the present year. He testified that he was editor of the American Medico-Surgical Bulletin, a publication in which he supposed Merck & Co. to be interested, although he had no direct knowledge on that point. He denied that he owned a drug store, but admitted that his wife did, and that he assisted her to some extent in the management of it. The store is located at 111 Smith street, Brooklyn. He testified that in 1894 he examined Paskola in his laboratory, taking notes of the various test reactions, but that he did not know where such notes were now. He kept them only until he had finished the work and written certain papers upon it. He said that an article which appeared in the June, 1894, number of the Druggists Circular practically embodied the results of those tests.

Charles A Molloy.

At this point Mr. Case objected to this whole line of examination, on the ground that it was irrelevant, incompetent, and objectionable for other reasons. The objection was overruled.

In answer to questions, Dr. Eccles testified that he had read an article before the New York State Pharmaceutical Association, at Saratoga, in May, 1894, in which he denounced Paskola as a preparation of glucose and muriatic acid, and described its effect as deleterious upon the system of any one predisposed to diabetes. Both articles were read by Dr. O'Sullivan, paragraph by paragraph, to the witness, who was asked whether he had written them as read. His invariable answer was, "It appears to be right."

An article in the New York Medical Journal, of November, 1894, was also read, and acknowledged by Dr. Eccles in the same way. He testified that the article in the Druggists' Circular had been written at the instance of Benjamin Lillard, manager of that publication. The witness had, however, received a letter some months before that asked the composition of Paskola, and had made some incomplete analyses at that time.

He admitted that he had been guided in his conclusion that Paskola consisted principally of glucose from its physical appearance. He said that in appearance it was suggestive of glucose, being of a pale straw color. He said that his tests had been made direct for glucose, and that he had not examined at that time for any ferments.

The purpose of the prosecution clearly was to discredit the witness as an impartial authority. One of his articles recommended cod liver oil in preference to glu-

THE PHARMACEUTICAL ERA

[*WEEKLY.*]

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Carbolic Acid Label.

The resolutions relating to the labeling of carbolic acid, adopted by the Wayne County (Mich.) Medical Society and reported in this journal last week, have attracted much attention. The suggestion that the mention of oil as an antidote be discontinued is the point of it all. We applied to the medical society named for the wording of a label which would be satisfactory to replace those now in use. Here is a portion of the reply received.

"Any soluble sulphate (and preferably magnesii sulphas) is the most perfect and efficient chemical antidote. The toxic effects are nearly identical with opium poisoning, and physiological antagonists are the same. Respiratory stimulants particularly are needed. The aim was to insure against the *danger of oils*, not to advocate any particular antidote."

Though it is something of a surprise to learn that carbolic acid kills as a narcotic, not as a corrosive and caustic, we have no exception to the statement, but we do decidedly object to the loose statement in the first sentence above quoted. "Any soluble sulphate;" this is altogether too general, too dangerous for use on a label. Think of giving copper sulphate or zinc sulphate (both soluble) or even ammonium sulphate. At first thought the choice would appear limited to magnesium or sodium sulphate, for even potassium sulphate, in our opinion, wouldn't be quite the thing. The members of the Wayne County society have rendered a timely service by their recommendation and they should complete the work by suggesting the proper antidote with specific instructions for printing on carbolic acid labels.

Care in Handling Poisons.

This is poison season with many people. Every careful housewife is now considering questions of spring house-cleaning, and laying in supplies of all sorts of material, paints and varnish and soap and insecticides and disinfectants galore. The druggist profits considerably from this activity, for he sells the bed-bug and roach destroyers, and the moth balls and camphor to pack away with the winter clothes. This is all as it should be, and it is gratifying to see the intelligent business interest which druggists display in advertising this feature of their business. But there is one aspect of the matter which should be well considered, the care which should be observed by druggist and purchaser in the handling of the various poisons now brought into household use. Corrosive sublimate for bugs, arsenic for rats, carbolic acid as a disinfectant, are active, dangerous poisons. The druggist's duty is to carefully label such articles in full observance of the law, common sense and safety, and the purchaser should be cautioned against their improper use. In the household, care should be taken that the labels do not become defaced or effaced, that poisonous liquids and solids are kept apart, away from the reach of children, and that their use be entrusted to only responsible and careful persons fully aware of their nature. Aside from their poisonous nature, some of these spring cleansers and poisons are dangerous because of their spirituous character, being readily inflammable, as for instance bug destroyers containing large portions of alcohol, naphtha.

benzine, or turpentine. This is also the time taken by most of the gentler sex to clean gloves and dress goods with naphtha, etc. This is a specially dangerous operation near any fire or light; caution here is not wasted. Housecleaning time has always been looked upon by the men as a purgatorial period of the year, and has furnished the theme for many a paragraph by the funny men. We see how serious it really is, when to its inconveniences and discomforts may be added the dangers of fire and poison.

Maine's New Pharmacy Law.

The druggists of Maine have succeeded in getting their pharmacy law amended and revised, and can be heartily congratulated upon the result. For twenty years the old law has been in effect, and because of its imperfections the board of pharmacy has found it practically impossible to keep Maine pharmacy up to the mark. The imperfections of the old law are made apparent by simple enumeration of the good features of the new act.

All applicants for registration must pass the board examination; no diplomas will be accepted. No exception is made, as heretofore, in favor of physicians, by which their diplomas were made the open sesame. They'll have to go up for exam., same as pharmacy graduates and everybody else, who really do know something about pharmacy. This one feature is a victory indeed, and brings old down-east Maine way up to the head of the procession.

Another particularly significant provision of the amended law is that relating to the country storekeeper, who hitherto has dealt in certain poisons and medicines of common use. Now the sale of these articles is limited to registered pharmacists in the cities and larger towns, but storekeepers in places where there are no drug stores are to be granted a permit, after showing fitness, "to sell the usual medicines and poisons used as home remedies and for the necessary agricultural purposes."

In various other respects is the law improved, notably in that it will no longer be almost an impossibility, as it has been heretofore, to convict and punish violators. The board is given powers in the administration of the law which are sure to result in much of good to the druggists and the people of Maine.

The New Disinfectant.

It is surprising as well as interesting to observe how we may go on for years in what we deem full acquaintance with a person, or a substance, when all at once it comes to us that we have not really known that person or that substance at all intimately, for a new trait or property is brought to light which must materially modify our former conceptions. In chemistry these surprises are quite frequent. The birth of synthetic organic chemistry was due as much to accident as design, the discovery that the percentage composition of urea is the same as that of ammonium cyanate. The medicinal properties of many drugs were discovered by accident, cinchona, for instance, and the sweetening power of saccharin. But it is astonishing that we may be familiar for years with some drug or chemical, and yet be ignorant of its most important property. We are just finding out the value of acetylene as an illuminant, yet acetylene is one of the first things the student of chemistry is asked to consider.

The incentive to these moralizings and this introduction is found in the old acquaintance, formaldehyde, which has recently startled us all by a display of its hitherto unknown excellencies. This article, under its customary chemical name, formaldehyde, or some one of its several trade-marked appellatives, is attracting universal attention as a most effective antiseptic, being vaunted as superior to all other for all-around purposes. Perhaps all we are told in its praise is not entirely warranted, but enough is proven to establish its high value in this direction. Aside from individual and private exploitation, formaldehyde has received much official sanction. Boards of Health and hospital authorities have given it their approval, and medical and pharmaceutical papers are printing reams in its favor. A special committee of the Michigan State Board of Health states that investigations seem to show that formaldehyde is the coming disinfectant. When properly used it is an efficient destroyer of germs, and its practical utility is apparent because of its simplicity and cheapness. Although this disinfectant is extremely deadly to all forms of life, it is not a dangerous disinfectant to use; and then again it does not injure clothing, silver, etc., as is quite likely to be the case with sulphur fumes when not properly used. Because of its cheapness and simplicity the committee is inclined to believe that the disinfectant should be kept ready for use in every household, not only for killing germs, but to destroy carpet beetles, moths, etc., which are so annoying to the housewife, and destructive to property. Formaldehyde is a gas which may be formed by a partial burning of common wood-alcohol in the presence of a limited amount of air, and passing the vapors over finely divided platinum or copper. Various burners for this purpose have been devised.

The Cost of Medicine.

A couple of weeks ago we commented upon the wonderful progress effected in medicine and pharmacy during the past thirty years, quoting some of Mr. Martindale's most significant illustrations. He goes on to show that with the advance in chemical methods the cost of production has with most drugs been greatly reduced, though this factor has not in his opinion always the same bearing with regard to the popular use of medicines that it has in commercial economy; for example, quinine is not used in a popular way in England "to anything the extent that it was when its value was five to ten times what it is now. The public and the medical faculty have no reason to complain of the costliness of drugs at the present time; when required in quantity or for hospital use, they are with few exceptions supplied at much lower prices, as well as in a state of greater purity, owing to more extensive manufacture, commercial enterprise and chemical ingenuity, than was possible twenty-six years ago."

To this, however, he adds the very fair comment upon the cost to the patient of his medicines and the just reason for the pharmacist's charges: "But the cost of distribution, which is not merely a trade distribution, has to be taken into consideration; here the comparatively small demand for most of the articles used in medicine, precludes the distributer or retailer from supplying them to the public at a commensurate reduction in price, as the judgment necessary in the distribution of medicine and the care and skill requisite in their manipulation have necessitated the careful and scientific training of those who deal in them. Hence his remuneration is not for material supplied but for special service rendered, and is therefore in many cases out of proportion to the actual commercial value of his commodities. This applies to the simple sale of drugs, though the argument is much stronger when applied to the compounding of medicines."

The business manager of the Rocky Mountain Druggist has resigned and sold out his interest in that paper "because of difference of opinion as to the policy to be pursued." We don't blame him, if the policy of that publication is to continue to be what it has recently been.

M. J. Breitenbach.

M. J. Breitenbach, of M. J. Breitenbach & Co., came to New York in 1874 with two dollars in his pocket, which represented his entire capital at that time. He was regularly apprenticed to Schoenrock & Kessler, who had two retail drug stores, one on Thirty-fourth street and the other on Eighteenth street and Avenue A where, under the personal supervision of Mr. Schoenrock he learned pharmacy in the old-fashioned way. Mr. Schoenrock was a German who had passed what is known on the other side the water as a "Staats Examen," which was a superior test. He made young Breitenbach learn his knowledge by the hard road of experience. All the ointments had to be prepared by hand, and in the case of mercurial ointment this required a whole week of steady application at a big mortar. Mr. Schoenrock was accustomed to come down toward the close of the week to see how the work was progressing. He would take a sample of the ointment, spread it on some white surface and carry it over to the light where he would examine it through a magnifying glass, to see whether he could pick out the globules. If he could see a single globule of mercury he exhorted the boy to renewed exertions.

Mr. Breitenbach was born in Albany, Ga., in 1856, and got most of his education in the public schools of Newark, N. J. He graduated from the New York College of Pharmacy just before it removed from the old University Building in Washington Square. He afterward worked for Tsheppe & Schur, at Sixtieth street and Third avenue.

In those days Dung's Pharmacy, at the corner of Canal street and the Bowery, was famous. It had been established in 1851 by Albert Dung, when a large proportion of the well-to-do inhabitants of New York resided about the Bowery. Mr. Breitenbach secured a position as clerk in this house in 1878, at which time Albert C. Dung was then proprietor. He became manager of it in 1881, and owner in 1883. Upon the death of Mr. Dung, Sr., his son, Albert C., removed with his mother and family to Germany, where he now resides. Mr. Breitenbach not only took charge of the store, but was entrusted with a great many fiduciary cares by Albert C. Dung. He prospered and opened a store on Madison avenue in 1891. This venture proving successful, he decided to go into the proprietary business, and in 1892 opened an office at 56 Warren street for the sale of the well known Pepto-Mangan, the invention of Dr. A. Gude, of Leipsig, Germany, who manufactures it for him.

Of course Mr. Breitenbach took his goods around to Crittenton & Co.'s, as all handlers of new proprietary medicines are wont to do, and in that way Edward G. Wells became interested. The business has grown to such proportions that Mr. Wells has severed his connection with Crittenton and gone down to the other office to devote his whole time to the specialty.

Mr. Breitenbach lives with his family at the Hotel Graham at Eighty-ninth street and Madison avenue. His wife was Miss Jennie Mayer, of New York. They have one son. Mr. Breitenbach is too busy a man to belong to many clubs. He has been a member of the Freundschaft Club of New York for fifteen years, and is known as an expert bowler there. When he wants to enjoy himself, he goes back to his boyhood home in Georgia. He is now on the point of going with his family to Europe, where he has many freinds.

Correspondence.

We are pleased to publish here communications from our readers on topics of interest to the drug trade. Writers are requested to express their views as briefly as possible. Each article must be signed by its writer, but his name will not be published if so requested.

Not Just as Good, but Better.

To the Editor: I read the noble tirade of some manufacturer of patent medicine in your last issue, and I must say that I, like the one who waileth, also deplore the "almost proverbial" "Just as good," for the conscientious druggist who cannot make a better preparation than nine-tenths of those weak and washy slops called "Patents," whose makers put five cents' worth of drugs into a bottle and spend fifty-five cents a bottle to advertise it (including high-priced testimonials and low figures to department stores, who give them space in their ads.), deserves to be quietly yet firmly ejected from the practice of pharmacy.

Never say you have a medicine "just as good" as these concoctions, but when called upon for a good honest preparation, give the only thing that you can really recommend, your own make, the ingredients of which you know.

The consequence will be that you have a satisfied customer who, when he wants a "tonic," a "spring medicine" or a "nervine," will come direct to your store, for that is the only store where he can get the preparation he wants, although he passes a dozen places where they keep Slob's Sarsaparilla, Ache's Silly Compound, or Greenhorn's Nerve Twister.

No "Just as good," but always "Very much better."

HAPPY HARRY, '93.

THE DINGLEY TARIFF AND SODA PRODUCTS.

Detroit, Mich., April 16.

To the Editor: There has been considerable "juggling" of the tariff on the products of salt, viz., bicarbonate of soda, sulphate of soda, soda ash and caustic soda. This has been done by the Ways and Means Committee, who evidently had little understanding of the necessities of the case. The tariff is supposed to be for the purpose of raising revenue, principally, and for protecting American industries, incidentally. With that purpose in view, it is customary, as in the case of wool, to make the tariff moderate on the raw material, and to increase the impost as the material is advanced in manufacture. This process has been revised in the case of the sodas. Bicarbonate of soda is one of the cheaper products obtained from salt, and the duty on it, which long stood at 1 cent a pound, was reduced to ½ cent a pound by the Wilson law. The Dingley bill proposes to raise this to ¾ cent a pound. Sal soda, another cheap product, containing a large quantity of the water of crystallization, was formerly protected by a duty of ¼ cent a pound. The Wilson law reduced it to ⅛ cent; the Dingley bill restores the original ¼. The duty on sulphate of soda, still another cheap by-product, was reduced from a duty of $1.25 per ton to the free list by the Wilson law; the Dingley bill restores the original $1.25.

Soda ash is developed by chemical processes from bicarbonate of soda, and consequently much more labor and expense are involved in its production. The duty on it since 1883 has remained at ¼ cent a pound, and the

Dingley bill leaves it untouched. Caustic soda, the most advanced of all the salt products, because it involves the greatest amount of labor, was reduced by the Wilson law from 1 cent to ½ cent a pound. Here again the Dingley bill makes no change.

In the vicinity of Detroit several millions of dollars have been invested, and several mammoth plants erected for the production of these chemicals. Thousands of workmen are employed. The manufacturers who have invested their capital ask that the Dingley bill be revised to make the tariff more consistent. They believe that a tariff of at least 1 cent a pound should be placed on caustic soda and ½ cent a pound on soda ash. Their reason for asking this is that they are brought face to face with a peculiar class of competition. English manufacturers are able to make the United States a dumping ground for their surplus of these products. English manufacturers have entered into a combination in England, and have put up prices to such a figure that they can sell this surplus exported to America at cost, and a price of $8.75 per long ton of 2,240 pounds has been agreed upon, free on board at Liverpool. The freight rate from Liverpool to New York, which this syndicate enjoys is $1 per long ton, whereas American soda ash plants, which can produce the product as cheaply as the English, find that they are barred out of the free trade English market by a prohibitive freight rate of $6.20 per short ton of 2,000 pounds. This is a handicap of $5,20 per ton, which the American producers are compelled to carry, and in retaliation they ask for an increase of duty as above stated. This subject has been brought to the attention of every Michigan representative in Congress, and a united effort will be made to secure the desired alteration.

INTERESTED.

(Concluded from Page 452)

*SOME MEDICINAL PLANTS.**

BY SMITH ELY JELLIFFE.

Digitalis.—The foxglove, which grows in stately clusters in old-fashioned gardens, has been known since the sixteenth century as having virtue in its leaves. Its common name used to be fox-glew, which meant fox music, for that was the name of an old-fashioned musical instrument that had bells hanging from an arched support. Its medicinal properties are important and well known to pharmacists.

Hamamelis.—Witch hazel is one of our native remedies that has hitherto been used chiefly as a household remedy for bumps and bruises and sunburn and many of the ills that are treated at home; but of late years it is beginning to gain some importance in the treatment of certain skin diseases, but not in the form of bottled witch hazel. It is in the young branches and leaves of this, the last flower of the year, that the medical properties are found and they must be extracted by making a saturated tincture.

It is a significant fact that the root tox of the word toxicology, which means the science of poisoning, can be traced back to a very ancient word meaning bow or arrow, or some instrument to kill; hence, it is supposed that the power of poison was known to the savage, and that he either dipped his arrows in the blood of an enemy or in the juice of some poisonous plant, so that in addition to wounding his victim the poison would take effect and sooner or later produce death. Of course, the savage would attribute the power to some mysterious agency, for nothing definite was known of poisons until civilization was pretty well advanced. Then the practices to which the knowledge was put were something frightful. Such plants are strophanthus and curare.

The next half dozen plants which I shall show you were not known as medicines in early days but as poisons. It is true of nearly all our efficacious drugs that a large dose will be fatal either by over-stimulating and paralyzing the action of the heart, or by paralyzing the respiratory centers; or, while a smaller dose would have the same effect in a lesser degree and could be used beneficially to counteract the action of some illness.

Conium Maculatum.—In Greece poisoning was the means of capital punishment. They gave a cup called koneion to the victim, which potion caused death without pain. It was of this that Socrates was given to drink. It is supposed that our poison hemlock is identical with the plant from which this poison was made, although some authorities differ on the subject. The poison hemlock is a native of Europe and Asia, but it has been introduced into this country and is common in waste places in the northern and middle States. It has a fine parsley-like leaf and white flowers. Some cases of accidental poisoning have taken place of people who ate the leaves for parsley. It may be known by its purple spotted stem. All parts of the plant are poisonous, but the seeds are especially powerful. It has not been very largely used in medicine, although some physicians use it for cancer and certain nervous diseases, and here again there are cases on record where poisoning has occurred in using it in treating that disease. The fact that the Greeks used the poison as the means of capital punishment led undoubtedly to the custom of taking it for suicidal purposes. To commit suicide was held noble in those days, and it is a fact that even later, in one of the European cities, the public authorities kept a poison of which the poison hemlock was an ingredient, and if any person showed good reason why he should not live longer he was allowed a dose.

With the suicides the habit of murder by poison was fearfully prevalent. It is said that it was so common that in India the Brahmins instituted the habit of suttee, the self-immolation of the Hindoo wife upon the burning pyre of her husband to put a stop to the murders which were the outcome of the most trivial infelicities.

Aconite.—It is said that in the fourth century, B. C., Phrysa poisoned the queen Satira by cutting meat with a knife that was poisoned on one side only. Whether this is a fable or not, it is certain that aconite was known at that time, and could have been introduced in that way in sufficient quantity to destroy life. Aconite, or Monks' hood, as we call it when we cultivate it for ornament in our gardens, is a beautiful plant with blue flowers. It grows in most parts of the world, and was known to the ancient Chinese as an arrow poison. The root contains the fatal element. A single root which had been bruised and thrown into a tank of water which was intended for a troop of British soldiers in India, would have been fatal to all who drank, had not the plot been discovered. In England and on the continent it is used only in very small doses as a medicine, but in India, so a native once told an Englishman, "it was useful to poison arrows for wild beasts, to the rich for putting troublesome relations out of the way and to jealous husbands for destroying faithless wives." Its effect in entering the human body either through a wound or by the stomach is to depress the action of the heart. That is why it is used with good effect in fevers when the action of the heart is excessive.

Veratrum Viride.—Any one walking through our spring woods cannot fail to notice the strong fresh leaves of the green hellebore, which later bears a spike of whitish flowers. This plant is used largely in veterinary medicine. The common use of hellebore as an insecticide is by no means modern, for the Romans used it for that purpose as well as in their mice and rat poisons. The root of the hellebore is the part that contains the poisonous element. It is very difficult to dig up, for it is a stout and stubborn root, which defies the botanist who wants it in his collection.

Hyoscyamus Niger.—The hairy weed, henbane, with its yellow flowers, that grows commonly in Great Britain and in some parts of the United States, has medicinal properties in its leaves. It is used in asylums to quiet maniacs who become violent. Its root, however, is reported to have an opposite effect, for the story is told on good authority that in a certain cloister the monks ate the root of henbane by mistake. In the night they were all taken with hallucinations, so that the pious convent was like a madhouse. One monk sounded the matins at midnight. When they responded by coming into the chapel, some could not read and others read what was not in the book, while others sang drinking songs and made the liveliest kind of disturbance.

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* Lecture delivered at the Museum of Natural History (New York), March 27.

Belladonna.—Possibly the root of which they ate was belladonna, for an overdose of atropine, which is the active principle from it, produces a delirium which often resembles insanity. Belladonna, or the Deadly Nightshade, belongs to the same family as the potato. It is not indigenous to this country, but a good many allied species grow here. It is well known that there are cases of potato poisoning on record from eating raw the very young potatoes, which seem to contain some of the deadly principle common to the family.

Stramonium Datura.—In addition to the henbane and the deadly nightshade, there is a very common poisonous plant in the family of the Solanaceæ, the Stramonium Datura, or thorn apple. It grows in vacant lots with us, and is known by its white flower, shaped something like a morning glory, and its prickly burr. From it atropine is also obtained. In India it is very common and the drug has been known to the Hindoos from the most remote time, under the Sanscrit name of dhatoora. It seems to have been often used to make persons of high rank insane, when it was feared that their brains would prove too much for the sovereign. But although belladonna or its alkaloid atropine is a very highly dangerous poison, threatening the little children who gather the deadly nightshade berries, yet as a medicine it has excellent effects. As is well known, it dilates the pupil of the eye, and is used for that purpose by oculists. It also constricts the blood vessels and is therefore used to check the inflammation in colds, and as it slightly paralyzes the nerve end organs it is very efficacious in neuralgia. But to show how carefully it must be administered, I might cite a case on record of accidental poisoning. The patient showed all the symptoms of belladonna poisoning, but could not find out how he had taken it, until it was discovered that the cook had strained some coffe which he had drunk throug a piece of linen which months before had been soaked in an eye wash of atropine, and had been laid aside and forgotten. Atropine has been proved a perfect antidote for the poisonous mushrooms which so closely resemble the good field mushroom, and in many ways has made up to the medical world for its black record of suicides and murders.

Thea Chiensis.—There are several plants in daily household use which, though not strictly medicinal, have nevertheless a distinct physiological action. I refer to the tea, coffee and tobacco plants. In the leaves of the tea plant there is an appreciable amount of tannic acid, which leaves its effect on the stomachs of excessive tea drinkers. Tea is to some a decided nerve stimulant, but not so much so as caffeine.

Coffea Arabica.—Coffee, whose active principle, caffeine, is contained in the berry, has a powerful effect in counteracting the effect of certain poisons, which, like opium, tend to stupefy the senses. It is an anti-narcotic, and to those who are not habitual coffee drinkers it has as stimulating an effect as wine, and will restore the tone of the nerves, for a time at least. Its effect lasts but a few hours, therefore many people who are unable to drink coffee at night without paying the penalty of sleeplessness, can drink it in the morning, but, like all stimulants, it becomes a necessity to the habitué, and without it the nerves lack their tone and the person is depressed and devoid of energy.

Nicotiana Tabacum.—The effect of tobacco, on the other hand, is narcotic and soothing to the nerves when smoked. The virtue, as in tea, resides in the leaves, and is retained when dried. The narcotic element in tobacco is nicotine, which is a very deadly poison. It has no use medicinally, except among the lower classes. I have gone to dress the wounded hand of a laboring man, and found that his first application to the cut was to clap his quid of tobacco upon it before it had even been washed. Cases of poisoning have occurred in this way, for nicotine can be taken in through the blood as well as through the stomach. It is very powerful in the latter way; men have died from the effects of accidentally swallowing their quid of tobacco. But while poisoning from the pure nicotine of tobacco is very rare, almost every one who learns to smoke suffers a slight degree of tobacco poisoning at first. The very unpleasant symptoms that almost invariably overtake the tyro are the well marked signs of the poisonous effects, but the human body quickly accustoms itself to the new conditions, and the smoker passes on to the state where he finds the smoke acting as a sedative to his nerves, and then to the point where he cannot control his nerves without its influence.

Opium.—Perhaps the mose useful and the most abused drug known to mankind is opium. The word covers generically the dozen or more different medicines made from the juice of the poppy, as well as the crude drug. Something was known about it as early as the third century, B. C., and all along through the writings of the ancient philosophers there are references to the poppy juice, and even directions as to the best way of cutting the globular fruit of the poppy to let the juice run out. The home of the drug was evidently not China but Asia Minor, and it was introduced to India by the spread of Islamism and also to China by the Arabs. The cultivation is carried on throughout Asia Minor on the more elevated land, the cultivators being mostly small peasant proprietors. The plant requires a naturally rich and moist soil, further improved by manure, not to mention much care and attention on the part of the grower. Spring frosts, droughts or locusts sometimes effect its complete destruction. The sowing takes place at intervals from November to March, partly to insure against risks of total failure, and partly in order that the plants may not all come to perfection at the same time.

The plants flower between May and July, according to the elevation of the land. A few days after the fall of the petals the poppy head, being about an inch and a half in diameter, is ready for incision. The incision is made with a knife transversely, about half way up the capsule, and extends over about two-thirds the circumference, or is carried spirally beyond its starting point. Great nicety is required not to cut too deep so as to penetrate the capsule, as, in that case, some of the juice would flow inside and be lost. The incisions are generally made in the afternoon and the next morning are found covered with exuded juice. This is scraped off with a knife, the gatherer transferring it to a poppy leaf, which he holds in his left hand. At every alternate scraping, the knife is wetted with saliva by drawing it through the mouth, the object being to prevent the adhesion of juice to the blade. Each poppy head is, as a rule, cut only once; but as a plant produces several heads, all of which are not at the proper age at the same time, the operation of incising and gathering has to be gone over two or three times on the same ground.

As soon as a sufficient quantity of the half-dried juice has been collected to form a cake or lump, it is wrapped in poppy leaves and put for a short time to dry in the shade. There is no given size for cakes of opium, and these vary in weight up to more than two pounds. In some villages it is the habit to make the masses larger than in others. Before the opium is ready for the market, a meeting of the buyers and sellers is held in each district, at which the price to be asked is discussed and settled—the peasants being most of them in debt to the buyers or merchants. To the latter the opium is sold in a very soft but natural state. These dealers sometimes manipulate the soft drug with a wooden pestle into larger masses which they wrap in poppy leaves and pack in cotton bags, sealed at the mouth, for transport to Smyrna.

According to another account, the opium as obtained from the grower is at once packed in bags, together with a quantity of little chaffy fruits of a dock to prevent the lumps from sticking together, and so brought in baskets to Smyrna and ports further north.

In these days of modern philanthropy, when hospitals and dispensaries abound, and when no physician refuses to treat a patient because he is poor, there is a tendency upon the part of the public to feel that the world owes him his medicines and his cures. There is a prevalent feeling that the druggist charges fifty cents for what is worth five, and that the profits go into plate glass windows and marble floors at the expense of the poor unfortunates that have been forced to patronize his wares.

But if these same victims had any conception of the labor, the danger and the expense that were involved in bringing drugs together from all parts of the world and preparing them in an exact and scientific form so that at half an hour's notice the combination which the physician orders of physic from India and Peru can be handed over the counter, labeled with directions; if they even thought for a moment of the thousands of miles their powders had traveled or the years of scientific experiment that had made their values exactly known, they would pay for their prescriptions without a murmur.

As an instance of how a valuable drug may be discovered and put upon the market it may be of interest to glance at the history of quinine.

Tradition tells us that an Indian of South America, who was lying helpless in the wilderness, sick of a violent fever, dragged himself to a pool of water near at hand to quench his burning thirst. After drinking he felt his strength gradually returning, so that he was able to get up and go home.

His experience occasioned great surprise, as no remedy was known for intermittent fever; therefore, the place was visited. The bitter taste that the water had seemed after long search to be caused by the bark of one of the trees lying in the pool and which resembled other trees growing nearby.

This may have led to a similar use of the bark of the tree by other sick natives, but nothing was known of it to the civilized public until it happened that the wife of the Viceroy of Peru was lying ill of the fever, and a Jesuit priest recommended the use of the bark of this particular tree ground to a powder. The cure was considered so wonderful that the Viceroy sent an expedition into the forest to collect the bark, and when he and his wife returned to Spain they gave away large quantities of it to the sick. The name of this Viceroy, whose wife was cured, was Luis Geronimo Fernandez de Cabrera y Bobadilla, fourth Count of Chinchon. The powder was popularly called by those who received it from the Countess of Chinchon "the Countess powder," but the scientific name given to the tree from which quinine is made is chincona. This name owes its origin to her as well, for the name Cinchona is derived from the name Chinchon. Quinine was known, among many other names, as Peruvian bark, and among the natives as quina or quina-quina. The Jesuits undoubtedly did much to make the virtues of the bark known, and just as soon as its healing powers became known South America had a new source of riches opened up. Expeditions were organized to search for the tree, which by this time was known to botanists as Cinchona. It was a tall evergreen tree, growing sometimes 80 feet high, and occurring singly in thick-tangled forests, and never in groves by itself as is the case with our pines. For a long time it was not known that there were so many different species of the cinchona tree, nor that these different species differed in medicinal value.

The expeditions in search of the cinchona required great courage and experience, for the trees were found in the mountainous regions of South America, at an altitude of 5,000 to 8,000 feet above the level of the sea. The collectors were known under the name of Cascarilleros. They united themselves into gangs under the direction of a major-domo and engaged themselves to some particular company. From the moment the party set out it was exposed to continuous dangers and hindrances, for the path had to be cut foot by foot through the primeval forest, where everything was laced together by the vines into an impenetrable tangle. Naturally the first collectors, thinking that the supply was endless, exterminated the trees that were nearest the seaports, so that days and even weeks were passed climbing mountain after mountain in search of forests where the cinchonas might be found. Then the forest around the precious trees had to be cleared so that they could be felled and barked. If the district appeared to be rich some huts were built and a little piece of ground rudely cultivated for food. At first the collectors believed that the supply of cinchona was inexhaustible, and they chopped down trees indiscriminately, cutting them off several feet from the ground to avoid the weariness of stooping, and throwing the branches away. They never thought of planting new trees in their place and very soon it became more and more difficult to get the bark on account of the expense and transportation. Also great dissatisfaction was felt in the countries to which the bark was sent on account of its poorness and variability. It was then ascertained that there were a number of species of cinchona, but how to discover which were the richest in quinine was the question, for the drug houses called their bark by commercial names, and the botanists by new names, which they gave to the trees as fast as they discovered new species.

Finally, some twenty-five or thirty years ago, the matter became the subject of careful scientific investigation. It was decided by analysis which species were the richest, and seeds of these were obtained and the cultivation of cinchona was begun. At first there was great difficulty, for the trees, accustomed to grow in the dense forest, would not thrive in nurseries, but as one experiment followed another, the cultivators were gradually enabled to raise the trees not only in South America, but also in India and in Java. The seeds, which are very small and fine, were planted and given their necessary shade by being covered with the common brake, a strong and hardy fern that gave them their forest shade. At first they tried to stock the nurseries with cuttings from the valuable trees, but these all died. Then they tried to obtain seeds, but to do this they had to let the trees grow in an open place in order to flower and perfect their seed. It took long years of trouble and debate upon the different methods of working before really good cinchona seeds were obtained, and these were then worth their weight in gold, and were counted by tens. The ground was prepared, a station was established at each nursery, and the seedlings started. Then came the question as to the best way of continuing the life of the tree, for they were no longer ruthlessly cut down for the sake of their bark. At first stripping in long sections was practiced, great care being taken not to girdle the tree. Then the system of "mossing" the trees was begun. The natives, after stripping the bark, would bind up the wound with moss or the fibers of the palm, and it was held by the experimenters that the new bark which was formed under the moss was richer than the other. The different nurseries each had different methods and great was the rivalry to raise the finest barks for the markets of the world.

Once the nurseries were established the attending preparations for the market were carried on. The bark was spread on frames and dried in the sun. The thin bark rolls up and dries in the form of quills, while the thicker bark is kept flat by being laid in piles.

After drying, the bark is made into packages and pressed to reduce its bulk for transportation, and it is then sent to factories where the quinine is made from it. The process of manufacture was also evolved after a long series of experiments, and to-day in the different factories in the world, it is said, that the secrets of each are carefully protected.

Then came experiments of physicians in the hospitals and in their private practice as to the value of quinine in various diseases, as well as the value of certain other alkaloids found in the bark, of which the laity hears less, but which nevertheless have decided remedial value.

And thus the history of other drugs might be traced from the plants or trees which grow in the tropics, to the perfected manufacture put up in the form of pills or powders and calculated to a nicety to heal all the ills that flesh is heir to.

THE ANTIQUITY AND HISTORY OF THE MORTAR

BY C. J. S. THOMPSON.

The mortar is the most ancient of pharmaceutical implements, its earliest use carrying us back to prehistoric times, when the early Briton bruised his grain in the hollow of a granite boulder. There is little doubt indeed that mortars were employed for the purpose of bruising and reducing hard bodies to powder, centuries before medicine as an art was thought of or known.

The name is derived from the Latin word mortarium, which is probably from the root *mordeo*, to bite, akin to the Sanscrit *mrid*, to grind or to pound; the literal meaning of the word being a vessel in which substances may be pounded with a pestle.

The origin of the mortar appears to have been identical with that of the mill, or quern, as it was called in ancient times. The primitive implement used by prehistoric nations for the purpose of crushing their grain was simply made by hollowing out a cup-shaped hole in a block of stone or granite, and pounding the grain placed in this receptacle with a smaller stone of suitable form. These grain-crushers composed of stone, together with stone rollers and pounders, have been found in the circular huts of the Britons in several parts of North Wales.

This method was also used by the early Jews before the Christian era for crushing their spices and gums, the knowledge of which they doubtless gathered from the Egyptians during the captivity.

In many of the ancient Egyptian papyri we find directions given to bruise certain herbs and roots, although no mention is made of the implement used for that purpose, but we have proof that mortars were employed by the Egyptians from many ancient carvings of stone still extant. It is interesting to note that the mortar has also been known to several Oriental and savage races from time immemorial, and in the mortar employed by the pharmacist to-day we have an implement that links us, not only with prehistoric man, but also with the savage races of the world. In Africa, mortars and pestles of wood have been used from a period of unknown antiquity for the purpose of crushing grain. The one illustrated in Fig. 1 is composed of wood, and was brought from Central Africa. In India, stone mortars with wooden pestles have for centuries been used for shelling and pounding rice. Fig. 2 represents a Cingalese mortar of stone, from 2 to 3 feet high, taken from a drawing of the seventeenth century. Coming to the time of the Roman Empire, we have the first real evidence of the use of the mortar for pharmaceutical purposes. Medicine and pharmacy allied, in the time of Celsus, had become practical arts, and we know from the preparations described by that author that practical appliances were necessary. Thus the malagma used as an application to the skin, was a kind of soft mass directed to be beaten up to the consistency of a thick paste, and the ingredients of the catapotia were often ordered to be bruised before being mixed.

Roman mortaria composed of earthenware are very commonly found, and many examples may be seen in most of our museums, among other Roman remains. They were chiefly made for culinary use, and although they vary very little in pattern, the sizes are numerous. The larger ones were, as a rule, very strongly made, and all had a thick divided rim with a rounded moulding. The inside was roughened with splinters of flint, or hard stone, or hard burnt earthenware, which was fixed on with a kind of "slip" or liquid clay, with which the Romans finished their ware. A wooden pestle was used with these mortaria, which were, no doubt, chiefly employed for triturating and mixing various condiments for domestic use. The Roman mortarium shown in Fig. 3 is 28 inches in breadth, and bears the stamp of the maker's name, showing it to be the work of one Publius Raso.

Some of the smaller mortaria found are composed of a very white clay of a vitreous character, burnt hard like porcelain, and are non-absorbent. These were probably used for mixing more delicate condiments. There were large manufactories for mortaria in Britain, situated chiefly in the South of England at the mouth of the Thames, and in Essex and Staffordshire. From these factories there was a considerable export trade to Rome and Gaul.

Roman mortars of stone are much rarer, and the one depicted in Fig. 4 is a unique specimen. It was with little doubt at one time used for pharmaceutical purposes. Composed of stone, with a solid square base, it stands about 12 inches high, and is about 8 inches broad. The notches at the corners are evidently intended for fixing it down on a wooden table or slab to keep it steady when being used for pounding or breaking up hard substances. Closely akin to mortars were the querns or small mills, used for grinding purposes from the Roman period. In shape they somewhat resembled the mortar, but were covered in at the top, having a hole in the center through which the pestle was worked. They were made of stone and wood. A beautiful example of a wooden quern, depicted in Fig. 5, stands 13 inches high, and is made of very hard wood. It is an exquisite specimen of the turner's art, some of the side mouldings being of great delicacy, no thicker than a fine needle, yet are perfectly true in every particular. The pestle was worked through the hole in the center of the cover. These wooden querns were used during the sixteenth and seventeenth centuries. There is little doubt that marble succeeded stone as a material for making mortars, and this brings us down to mediæval times, when the apothecaries, combining the practice of medicine and pharmacy, became wielders of the pestle.

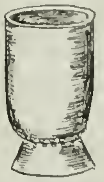
Fig. 1.

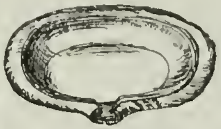
Fig. 3.

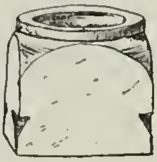
Fig. 4

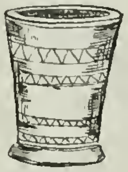
Fig. 2.

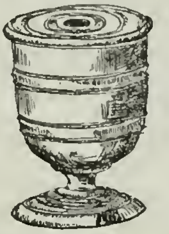
Fig 5.

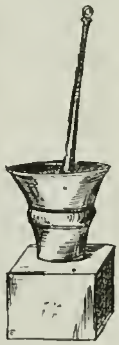
Fig. 6.

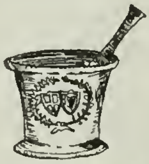
Fig. 7.

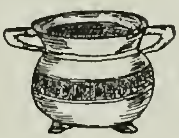
Fig 8

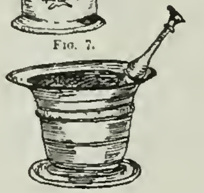
Fig 9.

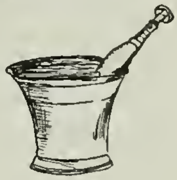
Fig 10

The value of the mortar as a pharmaceutical implement was recognized by these early practitioners, and was given the most prominent position in their shops, and so the pestle and mortar became a symbol or trade sign of pharmacy.

The great bell-shaped mortar, which was of considerable capacity, usually stood mounted on a solid block of wood near the center of the shop, the huge pestle, 3 feet or more in length, being suspended from a long wooden spring beam by a chain and ring. One can readily picture the youthful apprentice, clad in jerkin and trunk hose, exercising his muscle with the ponderous pestle, and with what mingled feelings he would essay the task of pounding half a hundredweight of aloes to begin his day's work, and give him an appetite for his midday meal. These large mortars were usually bell-shaped in form, as illustrated in Fig. 6, and composed of iron or bell metal. The smaller mortars of this period were made of brass, copper, or bell metal, and were occasionally ornamented with some symbol or device. They were often elegant in form, and usually stood in bright array on the shop counter. The pestles had flat tops and double ends, so that either end could be used for pounding.

The bell metal mortar, depicted in Fig. 7, dates from the time of Oliver Cromwell, and bears the arms of the Commonwealth on its side. It was probably once the property of an official State apothecary. The brass mortar shown in Fig. 8 is peculiar in shape, and is supported by four short legs. It dates from the early part of the seventeenth century, and round the middle are inscribed the letters of the alphabet. Fig. 9 represents a particularly handsome example of the brass mortar of the seventeenth century. Copper mortars when polished have a very elegant appearance, and are somewhat rare. One specimen in possession of the writer is depicted in Fig. 10. A very fine bell-shaped mortar of brass was found in Chester about two years ago, and is now deposited in the museum of that city. It stands nearly two feet high, and dates from the early part of the eighteenth century.

Small brass mortars were also formerly much used by housewives in the stillroom, for various domestic purposes, and may often yet be found ornamenting the kitchen mantel-shelf in old country houses.

During the last and early part of this century Italian marble was largely employed for making mortars, but with the introduction of wedgewood and composition ware, which is lighter, more durable, and less liable to be acted on by chemicals, marble mortars have now almost gone out of use with pharmacists. Small antique mortars of bronze are still to be found in many French pharmacies, often bearing some symbol or device, such as St. Michael and the dragon. They are generally much prized by their possessors.—(Ph. Jr.)

(Continued from Page 387, April 1.)

*LIST OF REACTIONS AND REAGENTS ACCORDING TO NAMES OF AUTHORS.**

REICHARDT'S—Test for Nitric Acid.—To a mixture of brucine and sulphuric acid a few drops of the fluid to be tested are added, a rose to deep red coloration ensues. This reaction takes place even in a dilution of 1 to 100,000.

REICHERT-MEISSL'S—Number.—This gives the number of cubic centimeters of $\frac{N}{10}$ alkali solution necessary for neutralizing the fatty acids from 5 gm. of the sample of fat. What was formerly understood under Reichert's number was the same equivalent for 2.5 gm. of fat. The Reichert's number is then ½ as large as the Reichert-Meissl's.

REICHL'S—Test for Glycerin.—Equal parts of glycerin, phenol and sulphuric acid are fused together and heated at 120° C.; the yellowish-brown solid mass is allowed to cool, covered with water, and aqua ammonia dropped upon it, whereby the mass is dissolved with a bright carmine red color.

REICHL-MIKOSCH'S.—Albumen Reagent.—This reagent consists of sulphuric acid to which a small quantity of benzaldehyde and ferric sulphate have been added.

REINSCH'S—Aresnic Test.—A solution of arsenous or arsenic acid in the presence of hydrochloric acid is reduced by metallic copper. A gray deposit of copper arsenite is formed upon the surface of the metal. Antimony and mercury react in the same manner, hence the absence of these must be proven first before the presence of arsenic may be presumed. This is also called Hager's kramato test.

REMAK'S—Microscopic Hardening Fluid.—A mixture of 50 cc. of aqueous 20 per cent copper sulphate solution, 50 cc. of alcohol (25°) and 35 drops of acetic acid (dilute). acid (dilute).

RENARD'S—Test for Arachis Oil.—This consists in isolating the arachic acid (melting point 75° C.) by means of its lead salt, from which it can be extracted with ether.

REUTER'S—Test for Presence of Para-Amido-Phenetol in Phenacetin.—Phenacetine is fused with pure chloral hydrate; when a violet color appears, amido-phenetol is present. The purest commercial samples show a feeble rose color.

REYNOLDS'—Test for Acetone in Urine.—The sample of urine is shaken with freshly precipitated mercuric oxide and filtered. If acetone is present, acetone mercury can then be found in the filtrate, and is tested in the usual manner for the presence of mercury.

RHEOCH'S—Test for Free Mineral Acids.—See Mohr's Test.

RICHARDSON'S—Test for Alpha-Naphthol.—In 1 to 2 cc. of water, 0.04 gm. of naphthol and 0.5 cc. normal sodium hydrate solution are dissolved. To this is added 0.05 gm. of sulphanilic acid, which has been dissolved in 5 cc. of normal sodium hydrate and 0.02 gm. of sodium nitrite dissolved in 5 cc. of normal sulphuric acid. Alpha-naphthol gives under these circumstances a dark blood red color which, on addition of diluted sulphuric acid changes to a brown. Beta-naphthol gives only a reddish-yellow color.

RICHMONT'S—Nitric Acid Test.—The substance to be examined is mixed with concentrated sulphuric acid, over this a layer of a solution of ferrous sulphate is poured. At the line of contact a purple to brown zone forms if nitric acid is present.

This is also called Desbassin's Reaction.

RIEGLER'S—Albumin Reagent.—This is Asaprol (calcium-naphthol sulfonate). This reagent precipitates albumin, albumoses, peptone and pepsin; the precipitates of the latter three are soluble on heating.

RINNMANN'S—Zinc Test.—When zinc oxide is heated on charcoal with a solution of cobalt nitrate a green color results.

RIPART'S—Solution for Microscopical Preparations. —This consists of a solution of 0.3 p. of copper acetate, 0.3 p. of copper chloride in a mixture of 75 p. of camphor water, 75 p. of distilled water and 1 p. of glacial acetic acid.

RITSERT'S—Glycerin Test.—On heating 1 cc. of glycerin with 1 cc. of aqua ammonia and 3 drops of a 5 per cent. silver nitrate solution to boiling, the mixture should show no change inside of five minutes. This test shows the presence of arsenous acid, acrolein and formic acid. Later investigators have shown this test to be unreliable.

RITSERT'S—Test for Phenacetin.—0.1 gm. of phenacetin is boiled with 1 cc. of concentrated hydrochloric acid for one minute, then the solution is diluted with 10 cc. of water; after cooling it is filtered and to the filtrate 3 drops of a 3 per cent. solution of chromic acid are added, whereby the fluid takes on gradually a ruby red color.

RITSERT'S—Sulfonal Test.—When sulfonal is heated with gallic or pyrogallic acid the odor of mercaptan is noticeable.

ROBERTS'—Albumen Test.—On adding the sample of urine so as to form a layer over a saturated solution of sodium chloride in 5 per cent. hydrochloric acid, a white zone forms at the line of contact if albumin is present.

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*From compilations of Dr Altschul (Phar. Centralhalle.)

ROBINET'S—Morphine Test.—On adding a solution of ferric chloride, which contains oxychloride of iron, to a neutral solution of morphine, an evanescent blue color is produced.

ROCH'S—Test for Albumin in Urine.—Salicyl-sulfonic acid solution precipitates albumin.

ROSE'S—Biuret Test for Albuminoids.—The solution containing albumin is made alkaline with sodium hydrate, then a dilute solution of copper sulphate (18 gm. cryst. $CuSO_4$ in 1 l. water) is added, the solution takes on first a rose color followed by a violet, then blue. This latter color differs from the copper in having a reddish cast.

ROSENBACH'S—Test for Biliary Colors.—Through careful addition of a 5 per cent. solution of chromic acid biliary urine is colored green.

See Rosenbach's modification. Gmelin's test.

ROSENSTIEHL'S—Aniline Test.—

See Runge's aniline test.

ROSIN'S—Test for Biliary Colors.—Over the sample of urine a few cc. of a dilute iodine solution are poured so as to form layers, if biliary colors are present a green ring forms.

ROSSBACH'S—Poison Test.—This consists in testing the action of alkaloids on infusoria. According to degree of dilution the action differs in intensity.

ROTH'S—Reagent for Fatty Oils.—Sulphuric acid (1.40 sp. gr.), which has been saturated with nitrous vapors, is brought in contact with the sample of oil which, according to the nature of the oil, causes changes in consistency and color.

Compare Poutet's Elaidin Test.

ROUSSIN'S—Crystals.—On adding an ethereal solution of iodine to an ethereal solution of nicotin an oily mass separates, which gradually forms ruby red crystals with a dark blue reflection.

DE LA ROYERE'S—Tests for Fatty Oils.—To a few drops of the oil are added two drops of a decolorized fuchsine solution which has been carefully neutralized with an alkali. Fatty oils, because of the presence of free acids, cause a reddening of this solution. According to Halpher, this test is of limited value, since mineral oils can also contain acids; also the acids present in some fats, as in lubricants, may be neutralized by the presence of alkaline soaps. Soaps can be identified by their reddening of congo red solution which has been first rendered violet by means of hydrochloric acid.

RUBNER'S—Test for Diabetic and Milk Sugars.—To the solution to be tested, basic acetate of lead and ammonia are added and the mixture heated: in the presence of either of the above sugars a red precipitate forms.

RUNGE'S—Aniline Test.—(a) A solution of aniline gives with a solution of chlorinated lime (in the absence of ammonium chloride) a violet color, which, upon the addition of acids, turns a rose color.

Rosentiehl's modification consists in adding some ether after the chlorinated lime in case the aniline is impure; this solvent serves to take up the brown products formed so that the aqueous fluid remains a pure blue.

(b) A pine wood shaving, which has been moistened with a very dilute solution of a salt of aniline, is colored yellow.

RUNGE'S—Test for Cane Sugar.—When evaporated with dilute sulphuric acid sugar blackens; many other organic bodies deport themselves likewise.

SACHSSE'S—Grape Sugar Test Solution.—This contains in one liter 18 gm. of mercuric iodide, 25 gm. of potassium iodide and 80 gm. of potassium hydrate. A modification of this is—

SACCHSE-HEINRICH'S—Test Solution.—This differs from the above in containing only 10 gm. of potassium hydrate. The sugar solution, containing about 5 per cent. of glucose, is slowly added to the boiling test solution until all of the mercury has been reduced. As indicator sulphuretted hydrogen water is employed which is added to portions of the solution to be tested which are previously acidulated with acetic acid. Each 40 cc. of the reagent are reduced by 0.1342 gm. of grape sugar.

SALKOWSKY'S—Test for Carbon Monoxide in Blood.—The sample of blood is diluted with 19 parts of water, and to this is added an equal volume of sodium hydrate solution (1.34 sp. gr.). Carbon monoxide blood shows a white turbidity, afterward becomes bright red; finally, red floccule collect upon the surface of the rose-colored fluid. Normal blood is colored a dirty brown by the alkali solution.

SALKOWSKY'S—Cholesterin Test.—The substance (for example, lanolin) to be examined is dissolved in chloroform and then shaken with concentrated sulphuric acid. If cholesterin is present the chloroform is colored blood red and the sulphuric acid takes on a greenish fluorescence. This can be made a contact test, the zone of contact showing a brown red color.

SALKOWSKY'S—Test for Peptone in Urine.—50 cc. of the urine are acidified with hydrochloric acid and precipitation carried on with phospho-wolframic acid. The precipitate is washed, then warmed on a water bath, dissolving in a little sodium hydrate solution, after which a few drops of a 1 to 2 per cent. solution of copper sulphate solution are added. In presence of a peptone red coloration ensues.

SALKOWSKY'S—Phenol Test.—On addition of aqua ammonia and a few drops of chlorinated lime an aqueous solution of phenol is colored blue or green.

SALKOWSKY'S—Test for Kreatinin.

See Weyl's Test.

SANDLUND'S—Test for Iodine in Urine.—To 5 cc. of urine 1 cc. of diluted sulphuric acid (1:5) and 2 to 3 drops of sodium nitrate solution (1 gm. in 500 cc.) are added and the entire shaken with carbon disulphide. If iodine is present even to the extent of 1/1000 per cent., the carbon disulphide is colored.

SCHAEFER'S—Quinine Oxalate Test.—1 gm. of crystalline or 0.85 gm. of dry quinine sulphate is dissolved in 35 cc. of water by boiling; to this is added a solution of 0.3 gm. of neutral cryst. potassium oxalate in 5 cc. of water; then by addition of water the solution is made up to 41.3 gm. The container is placed in a water bath (20° C.) for one-half hour, shaking occasionally, then filtering through glass wool. If the sample of quinine is free from side alkaloids, the addition of a drop of sodium hydrate solution (Ph. Ger.) to 10 cc. of the filtrate will not cause any turbidity.

SCHAEFFER'S—Test for Cinchonidin in Quinine Sulphate.—This "Tetrasulphate" test depends upon the insolubility of cinchonidin tetrasulphate in alcohol. One gm. of quinine sulphate is dissolved in 9 gm. of absolute alcohol and 3 gm. of 5 per cent. sulphuric acid. After standing a day with frequent agitation, some of the cinchonidin present precipitates as tetrasulphate. On precipitating the aqueous solution of this latter salt with sodium hydrate, pure cinchonidin of melting point 199° C. is obtained.

SCHAEFFER'S—Test for Nitrites in Urine.—3 to 4 cc. of the sample of urine, which has been decolorized with animal charcoal, is mixed with an equal volume of diluted acetic acid (1 : 10), followed by 2 drops of a 5 per cent. potassium ferrocyanide solution. If nitrites are present a yellow coloration results.

SCHAEFFER'S—Test for Martius Yellow in Confectionery.—From 10 to 20 gm. of the material are broken up fine and warmed with 40 cc. of alcohol of 50 to 60 per cent. Martius yellow colors the alcohol yellow, which, upon the addition of hydrochloric acid, disappears, while colors produced with saffron are unchanged by this treatment. Metanil yellow is colored red when thus treated.

SCHAER'S—Test for Blood.

See Huehnefeld's Turpentine Solution.

SCHAFFGOTS'—Solution for Precipitating Magnesia.—This solution can be employed without the use of an alkali; it consists of 235 gm. of ammonium carbonate and 180 cc. of aqua ammonia (0.920) diluted, which solution is diluted to one liter.

(To be Continued.)

ENGLISH PHARMACEUTICAL AFFAIRS.

London, April 9, 1897.—The chief topic in pharmaceutical circles in England at the present moment arises from the action of the Council of the Pharmaceutical Society in drafting

New By-Laws of the Society.

The items of importance in the proposed alterations are that the present preliminary examination should be replaced by the elementary examination of some recognized examining body and that its scope should be considerably extended, so that its value would be equivalent to that of the preliminary examination for medical study and, what is of more interest, that the fee for the minor examination should be raised from five to ten guineas, the additional five guineas being required for the increased expenditure necessary for carrying on the work entailed by the Pharmacy Act and the maintenance of the register.

The first alteration meets with almost universal approval, for it has been known many years that the pharmaceutical preliminary examination was not of corresponding value to the Minor, and that it did not insure a knowledge in some subjects which was needful when the student commenced work for his qualifying examination; but the second proposal, above mentioned, affects money matters, and pharmacists are keener on these than on education, and therefore have taken up the matter more thoroughly. The members of the society seem to think it will be a good step and that thereby the men who qualify and whose names are placed on the register, but who do not become members of the society, will thus do their share towards the maintenance of the register and the carrying on of the legal functions of the society for the common good. But, some ask, "Where has the increased expenditure come in, and how has the work been carried on for all these years without the necessity for so large a fee from the candidates?"

At the last annual general meeting the president assured his audience that, although the expenses of the past year had been considerable, yet, with proper management, there was no reason why they should not be able to carry on all the society's work without overrunning the constable in future; yet, here we have a scheme for increasing the income of the society, so we must hope it will do something extra in return, if it passes its new by-laws, for the chemists on the register.

The trade papers view the matter from their own standpoint, and suggest that the increased expenditure has been partly caused by the publication of the official organ, "The Pharmaceutical Journal," and as this has resulted in a considerable loss during the past few years, their contention carries some weight with it; the promoters of education also single out the cost of maintaining the School of Pharmacy for comment, and altogether it is somewhat doubtful whether the Privy Council will permit the adoption of the new scheme without some radical change.

Hunyadi.

Considerable interest has been aroused by a case in the Chancery Court between the proprietors of Hunyadi Janos Water and Apenta Water. The owners of the former property contended that the Apenta Water bore the name Hunyadi in addition and that caused it to be substituted for their product. The case was won by the plaintiffs who secured an injunction which restrains the importers of Apenta Water (The Apollinaris Company) from using the word Hunyadi for waters not obtained from the original springs.

It has been recently decided by the Home Office to include

Carbide of Calcium

in the Petroleum Act, and consequently sellers of it or acetylene must be licensed and their premises will have to be submitted to the same regulations as places where petroleum is stored. Regulations have been issued to all the local authorities who are intrusted with the administration of the Act and these point out the dangers of carbide of calcium itself and also of the generated acetylene, and the dangerous nature of the compounds of copper and acetylene. Several firms are selling carbide done up in cartridges for the automatic production of acetylene in specially contrived generators, and I understand that in country districts where access to the ordinary supply of coal gas is impossible, a very good trade is being done. Illumination is being made a more especial study of in Great Britain now, and the rivalry caused between the gas companies by the introduction of electric light has given rise to innumerable methods of improving the illuminating power of coal gas. The coal gas supplied to London has a uniform 16 candle power value, so that the introduction of systems of lighting and incandescent burners resolve themselves into questions of which will give the best light for the least consumption of gas. Acetylene, however, has a great future before it, and several companies are in the process of formation for its introduction on a large scale.

Study of Essential Oils.

John C. Umney.

Essential oils have become a most important class of goods during the past few years, and the researches which have been made upon their chemical composition and methods of examination have done much to recreate some faith in them, for the amount of "fake" which was carried on in Germany had reduced this to a minimum. Of the investigators who have taken this subject up from a trade standpoint Mr. John C. Umney is perhaps most widely known in London at the present time. His work on the Essential Oils of the British Pharmacopœia which was embodied in a paper read before the London Chemists' Assistants' Association summarized a large part of his work, but he has since published results obtained with several varieties of oils which are of considerable importance. At the last evening meeting of the Pharmaceutical Society he read a paper on "Fennel and Its Oil," which showed his capacity as an investigator, and also, what is of more importance to druggists and buyers, that Indian Fennel, which is the one most largely used in this country for the preparation of the powder and "Compound Licorice Powder," is of the least value. The Gallician variety is used almost entirely for the production of essential oil, and consequently the Indian, which contains less oil, is the one generally found on the market.

The shipments of large quantities of drugs and chemicals to the States has roused some shippers and made a lot of work during the last fortnight, but whether it is due to the expected new tariff or not, it has sent up the present prices of several articles, chlorate of potash, soda crystals and opium especially.

In the scientific world the last meeting of the Chemical Society was of importance owing to a communication from Messrs. Perkin & Thorpe on

The Synthesizing of Camphoronic Acid.

The results published show Bredt's formula for camphor to be the correct one and that the investigators are nearer than any previous workers to the solution of the problem of synthesizing camphor. At the same meeting some excitement was shown over the nomination of Professor Ramsay (of Argon fame) as president of the Chemical Society in place of Professor Dewar (of liquid air fame), who had been nominated by the council. The fellows do not often give way to such applause and demonstrations, and it shows what a high opinion most of them hold of Professor Ramsay, though he was defeated at the election of the society.

P. A. T. A.

I have had occasion in previous letters to mention the work of the Proprietary Articles Trade Association which was started at the beginning of 1896, and I now have an opportunity of sending the photo of Mr. W. S. Glyn-Jones, the secretary of the association, to whose indomitable energy the success which it has met has been greatly due. Mr. Glyn-Jones has done it for the good of the trade and not for any monetary consideration, and whereas two years since he was practically unknown to the trade at large, now one cannot find a weekly number of either of the trade papers which does not contain his name. The object of securing an agreement from wholesalers to maintain prices and to withhold supplies from any one who sells below bottom cutting price has worked successfully so far, and although March of 1896 showed that only fourteen articles were on the protected list, 1897 has a list of fifty. As the articles so dealt with are sold largely by grocers, the work of the secretary has extended to them somewhat, and negotiations have been entered into with the Grocers' Federation for obtaining their co-operation. The latest phase of his work however has been with the Photographic Trade, and as cutting is rife in this branch, a very successful meeting was held, when a trade gathering was called to consider the matter, and the result was the formation of a Photographic Branch of the P. A. T. A.

W. S. Glyn-Jones.

SOME OBSERVATIONS ON ACACIA OF COMMERCE.

By J. HENRY SCHROEDER, Ph. G.

Of all the drugs sent forth into the commerce of the world, there is, perhaps, no single one of which there exist so many varieties as of acacia. A difference in the source of production is one cause for the variableness in quality of the commercial article. In some cases the quality of the gum is lowered by the season of collection, and a secondary grade is obtained by assorting the other varieties. The chemical literature relating to the exact nature of the gums of different species of acacia is only limited, and they have, so far, been subjected to little thorough study. As their habitats vary greatly, they are usually known by the names of the localities where they are collected, or by the names of the ports from which they are shipped. For pharmaceutical uses the U. S. Pharmacopœia directs that the gum of Acacia Senegal be employed. It was with a view of determining the presence of dextrin in the powdered commercial "gum arabic" that an examination of different samples was undertaken.

It has been alleged that the high price of a good quality of gum has tempted those who handle the product, and that many of them have resorted to adulteration for pecuniary gain, dextrin being the substance usually employed for the purpose. While for merely technical purposes an addition of dextrin might not be a disadvantage, such adulterated gum is, of course, unfit for pharmaceutical purposes, especially for the preparation of emulsions. Observations were made during the work, which I think of sufficient interest to the pharmacist to report. Before submitting in detail the results of the examination, I desire to state that they are presented solely on account of the interest which they seem to possess for the practical pharmacist, with the consciousness that, considered as a scientific investigation, the important factor, completeness, is lacking.

According to the U. S. Pharmacopœia, acacia is "a gummy exudation from Acacia Senegal, Willdenow (nat. ord. Leguminosæ). Besides the description of the physical appearance of the gum, the following tests are also given:

(a) Acacia should be soluble in 2 parts of water; it should yield a gelatinous precipitate with basic lead acetate, T. S., ferric chloride, T. S., or concentrated solution of sodium borate, and does not reduce alkaline cupric tartrate, V. S.

(b) The powder is not colored blue (absence of starch), or red (absence of dextrin), by iodine, T. S.

In addition to these tests, it may be of interest to refer to two others for the presence of dextrin.

One, which is from Hager, Hartwich and Fischer's "Commentar zur Pharm., B." II., p. 44, is as follows:

"Three cc. of a solution composed of 15 drops of solution of ferric chloride, 15 drops of saturated solution of potassium ferri-cyanide, 5 drops of diluted hydrochloric acid (sp. gr. 1.165) and 60 cc. of distilled water, are added to 6 cc. of a solution of the suspected gum (strength of solution should be 20 per cent). If the gum be devoid of dextrin, it will be colored a pure yellowish brown tinge, this color remaining permanent during eight to ten hours. If dextrin be present, the color will change in about one hour to blue."

The other test, which is evidently a modification of the above method, is described in El Memorandum.

It seems to be erroneous, inasmuch as it contains potassium ferrocyanide instead of potassium ferricyanide, in presence of ferric chloride. The sulphuric acid present in the solution does not prevent the precipitation of ferric ferrocyanide. This test seems, therefore, inapplicable.

The foregoing are the tests upon which the examination of samples of commercial gum arabic was based.

While I was examining samples of the powdered gum in regard to their action upon alkaline cupric tartrate, V. S., I noticed that, in every instance, a marked reduction was taking place. A repetition of the experiments verified this observation. I decided to apply the test to a sample of the whole gum. For this purpose the best gum (answering the Pharmacopœial description in physical appearance) obtainable was employed. One gram was pulverized in a clean mortar, and dissolved in 10 cc. of recently distilled water.

Just sufficient potassium hydrate solution was added to give an alkaline reaction, and this solution heated with alkaline cupric tartrate, V. S., in a water bath (boiling temperature), during twenty minutes. Here, too, a well-defined reduction was observed, though seemingly less prominent than that produced by an equal amount of the powdered substance. When the test solution was heated, without the solution of gum, for an equal length of time, it remained clear. A like behavior of acacia is described in Hager, Hartwich and Fischer's "Commentar," as follows: "Acacia does not reduce Fehling's solution at 60° to 70°, but has a reducing action after being boiled with the reagent," and "dried gum in solution reduces Fehling's solution without being boiled, upon heating a solution for some time at water bath temperature."

The increased reduction by the powdered gum is probably due to drying previous to powdering it.

The iodine test for dextrin and starch was applied to each sample in powder and in the form of solution. When applied to the same powder it imparts to the powder only a light yellowish color of the iodine. If only traces of dextrin are present a dark red tint is produced. When a larger quantity of dextrin is present, the color produced by a few drops of the reagent is almost black. If starch and dextrin be present in the same sample, they can hardly be distinguished. One minim of the official T. S. of iodine will produce a decisive tint in solution of dextrin in distilled water, in proportion of 1 of the former to 2,000 of the latter. The presence of gum does not interfere with this reaction.

As commercial dextrin is not a product of definite composition and constant proportions, the delicacy of the iodine test may, of course, vary accordingly.

As all the samples of gum gave negative results with iodine, traces of dextrin and starch were added to the sample under examination; the reagent in all cases gave prompt indication of their presence, showing that there was present in the original sample nothing to mask the reaction.

The potassium ferricyanide reaction did not give satisfactory results. The test solution was prepared as above described from clear crystals of potassium ferricyanide, previously washed with distilled water to free it from any adherent ferrous salt, which might have formed by exposure to light. By reduction with the ferric chloride it produced a pure yellowish brown color, without a bluish shade, proving the absence of ferrous salt.

(a) When diluted with distilled water, it remained unchanged during twelve hours.

(b) A 1 per cent. solution of dextrin in distilled water caused almost immediate reduction and consequently a blue color.

(c) The reaction with finely powdered gum arabic proved somewhat less rapid than that with pure dextrin, but the blue color was produced within twenty minutes (powder free from dextrin by iodine test).

(d) Powdered gum arabic, adulterated with dextrin, reduced the solution after a few minutes' time.

(e) When a tear of the gum was dropped into the solution of potassium ferricyanide, the solution did not acquire a blue color within two hours; but after standing a few minutes the outer surface of the tear of gum was colored a decidedly bluish tinge. When a tear of the gum was powdered, and then some of the potassium ferricyanide solution added, reduction with formation of a blue color took place more rapidly, agitation increasing the action.

Is it not possible that the drying of the gum or that other influences cause a change to take place in the gum acacia, which might account for the reaction with alkaline cupric tartrate and potassium ferricyanide solutions?

In order to determine the quality of the commercial powdered acacia, samples were obtained, as far as possible, from the source of supply of the market, though the majority were obtained in pharmacies in Ohio, Indiana, New York, Pennsylvania and New Jersey.

All the samples were tasteless, and all reduced Fehling's solution, as described in the first part of this contribution.

The results seem to indicate that the cheaper grades of the gum are most frequently employed in the preparation of the powdered article, and that adulteration with dextrine is not generally practiced. Of course, the samples examined were only such as are used in pharmacies; and, no doubt, for technical purposes, one might be able to purchase gum wherein dextrin might be revealed.—(Am. Jour. Pharm.)

THE LOWEST TEMPERATURE thus far attained was 264° below zero Celsius, which Professor Olszewski employed in his experiments with the liquefaction of helium. This temperature was only 9° above the absolute theoretical zero point—273° C. According to this investigator helium can be used for filling thermometers which are employed for measuring very low temperatures.

PHARMACY.

SULPHUR HAS BEEN PATENTED in England as a filtering medium; owing to the fact that it is not readily attacked by most substances it answers in place of sand, being of finer character.

LABEL PASTE.—100 grams of borax are dissolved in 650 grams of hot water; to this are added 750 grams of white dextrin and 100 grams of liquid glucose, heating the mixture and stirring until all of the dextrin is dissolved. The heating should be done on a water bath.

WATERPROOF CEMENT.—Sandarac and mastic, of each 15 grams, are dissolved in 250 grams of alcohol; to this 15 grams of oil of turpentine are added and the mixture is heated to boiling in a flask. To this is slowly added (while shaking) a hot concentrated solution of equal parts of glue and isinglass in water until a thin paste ensues. This cement when once dry is waterproof.

BENZACETIN (Phenacetin-carboxylic acid) and its lithium compound are, according to Franck, prompt antineuralgics, which, without any side effects, act as sedatives in treatment of sleeplessness and excitable nervous symptoms in anæmic or hysterical women. The dose is 0.5 to 1 gram. Benzacetin forms colorless crystals which melt at 205° C., and is almost insoluble in water. The lithium salt is very soluble in water.

STERISOL.—The analysis of what is sold under this title and is used as an internal antiseptic in infectious diseases is as follows:

	Per cent.
Milk sugar	2.98
Sodium chloride	0.67
Sodium phosphate	0.32
Formaldehyde	0.52
Water	95.50

UNION OF CARBON AND HYDROGEN.—W. A. Bone and D. S. Jerdan find that (Jour. Chem. Soc., Pharm. Jour.) at a temperature of 1200° or thereabouts, carbon unites directly with hydrogen to form methane, no acetylene or other unsaturated hydrocarbon being formed at that temperature. Both methane and acetylene are formed when the electric arc is passed between carbon terminals in an atmosphere of hydrogen, while a state of equilibrium is finally established between hydrogen, methane and acetylene, if the passage of the arc be continued. Similarly, a state of equilibrium is produced when the electric arc is passed in an atmosphere of either methane or acetylene under similar conditions.

FERMENT FROM YEAST.—Dr. E. Buchner has extracted from yeast by pressure a liquid containing an alcohol-producing ferment which is capable of causing cane sugar or grape sugar to ferment in the absence of yeast cells (Berichte, Ph. Jr.) Milk sugar is not affected by the ferment. The addition of chloroform to the liquid, even up to the saturation point, does not inhibit the fermentative process, although it causes a rapid precipitation of albuminous matter. The liquid expressed from the yeast coagulates when heated to about 50° C., and the power of exciting fermentation is then entirely lost. It was also found that in the active liquid the ferment diffuses very slowly, if at all, through parchment paper. The ferment has been named "zymase" by its discoverer, and apparently is of a proteid nature, but further investigation will be required to decide this and other doubtful points.

COMPOSITION OF KAOLINS.—A comparative review of the composition of a number of American kaolins makes it evident that the wide difference in the proportions of clay and silica in them renders it imperatively necessary that the variations be taken into account in the selection of materials for the manufacture of ware; and that the United States is not wanting in an abundance of material for making porcelain equal to the best foreign production. The kaolin used in the Royal Berlin Factory at Charlottenburg is taken as the standard of comparison. One of the purest kaolins is found in Indiana, and clays of similar quality exist at Hockessen, Del.; Northampton County, Pa., and Middlesex County, N. J.—(Pop. Sci. Monthly.)

PIGMENTS OF PLANTS.—In an interesting paper in the Transactions of the Botanical Society of Edinburgh (Pharm. Jour.), Miss M. J. Newbigin gives a detailed account of the various coloring matters of leaves and flowers, which she divides into lipochromes and anthocyans, the former being insoluble, the latter soluble in water. The authoress states that there is no evidence that lipochromes are in any way derivatives of chlorophyll. She groups them into two classes, eucarotins and carotinins. Anthocyans are probably derivatives of tannins. The theory that their chief purpose is to protect chlorophyll against decomposition in a strong light is scarcely in harmony with some of the conditions under which they are commonly formed, as, for example, in young shoots in spring, and in autumn leaves. Etiolin is probably nearly allied to chlorophyll, these two being nearly the only pigments in the vegetable kingdom which contain nitrogen.

CARBORUNDUM PRODUCTION AND USE.—The Carborundum Company reports to us, says the Engineering and Mining Journal, Sci. Am., that its works have produced during the year 1896, in round numbers, 1,191,000 pounds, or 595¼ tons, of crystalline carborundum. Consideration at the present is given to the production in crystalline form only, but another important industry in which carbide of silicon promises to be a valuable adjunct will naturally increase the usefulness of the material. Some mention has been made of the experiments showing that carborundum can be used, and will, in all probability, take the place of ferro-silicon in the manufacture of steel. Prof. Luehrmann, of Germany, recently wrote an article on this subject, indicating that in the use of carborundum there will be in Germany alone, approximately, 2,500 tons consumed annually, provided its cost would not exceed six cents per pound. It may be used for this purpose in an amorphous form, and the Carborundum Company is prepared to furnish it at a price slightly under this figure.

A DISPENSING DIFFICULTY.—Mr. Welsh, of Chester, England, made the following mixture, and reported the results to the Liverpool Pharmaceutical Students' Association (Ch. & Dr.):

Antipyrin	4 scruples
Quinine sulphate	10 grains
Sulphuric acid, dilute	1 dram
Syrup orange	4 drams
Cinnamon water, to make	8 ounces

When sent out it was clear. On the bottle being returned to be refilled he was surprised to find a thick white precipitate deposited upon the sides and bottom of the bottle. He had found a note in the Pharmaceutical Journal, 1889, page 61, stating that cinchona alkaloids and antipyrin were incompatible. But he found that if made up with distilled water instead of cinnamon water, there was no cloudiness and no precipitate, even on standing several days. The antipyrin or the quinine made up with cinnamon water alone yielded a clear mixture. It appeared, therefore, that the cinnamon water had some action upon the quinine and antipyrin when together. He filtered the precipitate from the mixture made up as ordered, and found both antipyrin and quinine in the filtrate. He had also noted that, on adding a little diluted sulphuric acid, B. P., to the deposit, a distinct pink coloration took place, although little, if any, of the deposit was dissolved.

LIQUEFACTION OF AIR.—An apparatus for liquefying air by self-intensive refrigeration has been devised by W. Hampson (Nature, Ph. Jr.), and it appears to be a great improvement on that of Dr. Carl Linde, as the weight of the copper coil required is reduced to less than one-sixth that in the latter, the time required for liquefaction to less than one-fourth, and the pressure of the compressed air to less than one-half. Without the use of auxiliary refrigeration Linde was able, with a copper apparatus weighing 132 pounds, to liquefy air in two hours, with an average higher pressure of 190 atmospheres. Hampson's copper tube weighs twenty pounds only, and when supplied with air at an average pressure of 87 atmospheres, a jet of liquid air was seen in twenty-five minutes, while the liquid was collecting in the receiver in thirty-three minutes from the start. When the apparatus was cooled by continuous working the air began to collect again in two minutes after emptying the receiver, and accumulated at a good rate. No auxiliary cooling by carbonic acid or other agents was used to reduce the temperature of the compressed air before or after it reached the apparatus. The receiver is a glass vessel protected by a vacuum, of the kind invented by Crookes and improved by Dewar, and the apparatus can be worked without danger, as in the event of a joint giving way there is no risk of anything happening beyond "a mere blowing off."

SOLDERING ALUMINUM.—When exposed to the atmosphere an electrical action, or chemical action, as it is sometimes called, begins, and either the aluminum or the metals in the solder start oxidizing, which eventually results in a separation of the solder from the aluminum. This action is more rapid when aluminum has been used to manufacture a vessel to contain water. It can readily be seen from this that it is absolutely necessary that the surface of the aluminum must be thoroughly tinned, or protected as far as possible from atmospheric influence, in order to solder readily, and if the joint is to be a lasting one, the protection to the surface of the aluminum must be of a permanent nature. The difficulty in soldering aluminum has been to keep the surface entirely free from oxidation, the fluxes used in soldering other metals not being adapted for it. Solders that are best adapted for use with aluminum contain a percentage of zinc, or spelter, and those who wish to demonstrate that aluminum can be soldered have only to use stearine as a flux with an ordinary soldering copper and a solder which contains a small percentage of zinc, or that has been prepared on purpose for soldering this metal. It is quite possible that those who are expert in the use of soldering coppers can tin the surface and solder the joint with half-and-half solder, with stearine as a flux. Those who have soldered tin plate, copper, brass, zinc, and black iron, know that black iron is much more difficult to solder, because the surface must be thoroughly cleaned from all oxide and made bright. Those who have had the most experience do not attempt to solder the iron until it is in a perfectly clean condition. From the fact that aluminum presents a bright appearance, it is too often assumed by those who experiment in soldering that it may be readily soldered, while in fact as much care must be taken to have its surface perfectly clean as is taken in cleaning the surface of a piece of black sheet iron for soldering. Aluminum solder is made more durable and capable of standing the ravages of time by the addition of a percentage of silver, which immediately adds to the cost and also to the difficulty of soldering, as it must be done with a blowpipe, or by some other means by which the high temperature necessary for melting and fusing the solder can be secured.—(Metal Worker, Sci. Am.)

SUGAR ICING CONTAINING ZINC OXIDE.—In a communication from the Ducal Technical High School of Brunswick Herren H. Beckurts and G. Frerichs state that they have from time to time had to examine a white powder, apparently used for preparing the icing on gingerbread and similar confections. It contained 12.5 per cent. zinc oxide, about 50 per cent. sugar, glue or gelatine and water. Of five samples of gingerbread bought at an annual fair, one, on burning, gave the characteristic yellow ash, which became white on cooling, indicating the presence of zinc oxide; in two cases 0.0474 and 0.0544 grams of zinc oxide were found. As the weight of the icing was about 20 grams, it is evident that the powder is not used directly, but is mixed with sugar to prepare this icing, probably to heighten the white color, and thus enable inferior sugar to be used. As the authors point out, sudden attacks of illness in the case of children who have eaten these cakes can be accounted for on other grounds than that of over-eating.

[The attention of the abstracter was recently called to a case where a rat which had eaten one of the elastic faces sold in the streets of London for the amusement of children, and was afterwards killed and eaten by a (mongrel) terrier which died soon afterwards. On examining one of these faces it was found that the substance was made, not of indiarubber, but of a sugary material which slowly hardened on keeping, and probably contained a little gelatine or other jelly forming substance, and which left, on ignition, a considerable residue of zinc oxide. It is unnecessary to point out that such toys are unfit for young children to play with. Their sugary nature makes them doubly unsafe. —Br. & Col. Dr.]

A NEW DISCOVERY IN PHYSICS.—It has been announced, says the Electrical World (Scientific American), that Dr. P. Zeeman, of the Amsterdam University, while working at Leyden, discovered that the lines of a metallic spectrum are broadened when the source of light is in an intense magnetic field. The experiments of Dr. Zeeman were most rigorously and accurately conducted. Both emission and absorption spectra were examined with a large Rowland grating spectroscope, and the results were marked and certain. The meaning of the fact is clear to those versed in electro-optics, and, indeed, some such broadening had been predicted by several physicists and sought for by others. Dr. Lorentz, of Leyden, from theoretical considerations, ventured the prediction that the light at the edges of the broadened lines would be found to be polarized. This was completely verified by the experiments of Dr. Zeeman. The discovery will probably substantiate the hypothesis that radiation is due to the motion of electric charges, whether free or associated with the vibrating molecules of the luminous body. It has seemed more and more likely, as knowledge of ether physics has advanced, that radiation could not be excited by the motions of the inert molecules of matter, but must of necessity require their electrification. The new facts apparently demonstrate that this is true, and throw another ray of light upon the still obscure subject of the mechanism of radiation. Of course, the principal bearing of the discovery is upon the theory of light. It is a step toward more complete knowledge of the means by which the particles of a body at high temperature disturb the adjacent ether. It contains also the germs of conclusions regarding the nature of radiating and absorbing matter which may go far toward extending our knowledge of molecular and ether physics. There is little doubt that the solutions of the two mysteries—the nature of light and of electricity—are destined to be simultaneously attained. This discovery is probably the most important contribution to science since Röntgen's announcement of his new form of radiation. The fascinating field of speculation opened by each advance toward knowledge of the ultimate nature of electricity and radiation and the mechanism of the ether contains most alluring possibilities of discovery, and every step taken in such an advance is of the utmost importance to nearly every branch of science.

QUESTION BOX

The object of this department is to furnish our subscribers with reliable and tried formulas and to discuss questions relating to practical pharmacy, prescription work, dispensing difficulties, etc. Requests for information are not acknowledged by mail and ANONYMOUS COMMUNICATIONS RECEIVE NO ATTENTION.

Unanswered Queries.

Owing to the great number of inquiries received we are obliged to confine the services of this department to subscribers and their clerks. We therefore ask every correspondent who sends us queries to give his correct name and address and to state plainly whether he is a subscriber or clerk to a subscriber. Queries from others cannot be considered here. This will serve as answer to the queries this week of

Harry Cowan, Logansport, Ind.
Grace C. Brown, Jersey City, N. J.

Salol, Potassium Acetate and Spirit of Nitrous Ether.

(J. F. C.) asks criticism upon the following prescription:

Salol,	
Potassium acetate, of each	2 drams
Spirit nitrous ether,	
Water, of each	1 ounce

As spirit of nitrous ether almost always contains some free nitrous or nitric acid, there is a strong probability that salol will be decomposed with the formation of nitroso or nitro-derivatives of phenol and salicylic acid. A reaction of this character is evident by the gradual change in color of the mixture. In neutral mixtures these changes are likely to be retarded.

Lung Remedies.

(J. K.) Compound syrup of white pine and compound syrup of Irish moss of the National Formulary are formulas of the character you outline. Here are some others from the Era Formulary:

1.)	Cherry laurel water	1½ ounces
	Syrup wild cherry	3 ounces
	Solution acetate of morphine	½ ounce
	Dilute sulphuric acid	2 ounces
	Rose water	4 ounces
	Syrup poppies	40 ounces
2.)	Oil anise	1 dram
	Oil cinnamon	10 minims
	Oil coriander	5 minims
	Compound tincture benzoin	1 ounce
	Compound tincture camphor	3 ounces
	Vinegar of squills	6 ounces
	Syrup	5 ounces
	Mucilage tragacanth, enough to make	20 ounces

Dissolve the oils in the tinctures and add the mucilage; then mix in the rest of the ingredients.

Tooth Wash.

(C. E. M.) has been unable to obtain a satisfactory preparation from the following:

Castile soap, powdered	1½ ounces
Glycerin	4 ounces
Alcohol	6 ounces
Water	6 ounces
Oil peppermint	20 minims
Oil wintergreen	30 minims
Oil cloves	10 minims
Extract vanilla	½ ounce

He dissolved the soap in the water by the aid of heat and added to the solution the glycerin and the oils and extract of vanilla dissolved in the alcohol. Upon filtering the mixture he obtained a nice clear solution, which upon cooling "assumed a hard gelatinous mass." Upon again applying heat the mixture became liquid only to solidify again upon cooling. What shall he do to secure a clear solution?

Use a less quantity of soap, about ¾ of an ounce. See general remarks on saturated soap solutions in the United States Dispensatory under "soap liniment."

Tooth Paste.

(M. B.)

(1)	Precipitated chalk	8 ounces
	Powdered orris	8 ounces
	Powdered white castile soap	2 ounces
	Powdered borax	2 ounces
	Powdered myrrh	1 ounce
	Glycerin, q. s.	

Color and perfume to suit.

Cherry Tooth Paste.

(2)	Precipitated chalk	32 ounces
	Powdered orris	24 ounces
	Powdered cassia	1 ounce
	Carmine solution to color.	
	Honey	4 ounces
	Glycerin, to proper consistence.	
	Cherry flavor (artificial), to suit.	

Coca Tooth Paste.

(3)	Powdered white soap	1 ounce
	French chalk	3 ounces
	Cuttle fish bone	½ ounce
	Carmine	½ dram
	Tincture coca leaves	½ ounce
	Oil peppermint	20 minims
	Oil cascarilla	5 minims
	Oil linaloe	15 minims
	Glycerin, a sufficiency.	

Make into a paste (Era Formulary).

Remedy for Rheumatism.

(J. K.) We cannot construct a satisfactory formula upon the type you suggest from the fact that potassium iodide is incompatible with quinine sulphate. Try the following:

1.)	Potassium iodide	256 grains
	Tincture quassia	4 ounces
	Compound syrup of sarsaparilla, enough to make	16 ounces

The following formulas have been also recommended:

2.)	Sodium salicylate	2 drams
	Potassium iodide	2 drams
	Potassium acetate	2 drams
	Fluid extract cascara sagrada	4 fl. drams
	Glycerin	4 fl. drams
	Cinnamon water	4 fl. drams
	Peppermint water, enough to make	3 fl. ounces

Teaspoonful every four hours.

3.)	Potassium bicarbonate	5 ounces
	Potassium iodide	2½ ounces
	Sodium salicylate	2½ ounces
	Wine of colchicum	3¾ ounces
	Infusion of buchu, q. s. to make	1 gallon
4.)	Potassium iodide	3 drams
	Fluid extract hemlock	3 drams
	Fluid extract senna	8 drams
	Tincture colchicum root	3 drams
	Ammoniated tincture guaiac	4 drams
	Syrup sarsaparilla compound, q. s. to make	16 ounces

Essence of Pepsin and Potassium Iodide.

(W. C. C.) asks whether the ingredients in the following mixture are therapeutically compatible. He believes the "pepsin is rendered inert by the alkali":

Potassium iodide,
Essence pepsin,
Elixir three chlorides (R. & H.)

The proportions of the substances are not given, which, so far as compatibility is concerned, makes but little difference. There is no alkali here as our correspondent professes to believe, but there is the salt of an alkali, potassium iodide, and in this mixture it is likely to be decomposed by essence of pepsin, especially if the latter contains hydrochloric acid. Whether the therapeutic value of the mixture is thereby impaired or destroyed is a question. Other changes are likely to take place though the manufacturers of elixir of three chlorides claim that it is compatible with both iodides and pepsin. They state that each dram of the elixir contains "⅛ grain protochloride of iron, 1-128 grain bichloride of mercury, 1-280 grain chloride of arsenic and calisaya alkaloid cordial." Potassium iodide is decomposed by many of the metallic salts and especially by bichloride of mercury, the resulting compounds being either soluble or further decomposed by water. We suggest you try a few experiments using the proportions of the ingredients prescribed and you can easily tell whether the mixture should be dispensed or not.

Florida Water.

(H. M.) See this journal, Oct. 1, 1896, page 437. Here are some others:

(1)	Oil lavender	½ ounce
	Oil bergamot	1 ounce
	Oil cassie	1 dram
	Oil cloves	½ dram
	Oil neroli	½ dram
	Essence musk (No. 2)	½ ounce
	Alcohol	44 ounces
	Cinnamon water, enough to make	4 pints

Mix in the above order.

(2)	Oil bergamot	10 drams
	Oil lemon	6 drams
	Oil lavender	1 ounce
	Oil orange peel	½ ounce
	Oil cloves	1 dram
	Oil cinnamon	1 dram
	Oil neroli	1 dram
	Rose water	1 dram
	Alcohol	1 gallon
(3)	Oil lavender	2 drams
	Oil lemon	2 drams
	Oil bergamot	2 drams
	Oil neroli	1 dram
	Oil melissa	½ ounce
	Oil rose	10 minims
	Alcohol	32 ounces
(4)	Oil bergamot	1 ounce
	Oil orange peel	½ ounce
	Oil lavender	3 drams
	Oil cloves	1½ ounces
	Oil cinnamon	15 minims
	Tincture orris root	1 ounce
	Essence balsam peru	½ ounce
	Alcohol	30 ounces

Ointment of Stramonium.

(J. K.) For the official formula, see the United States Pharmacopœia. The formula official in the Pharmacopœia of 1840 was:

Fresh stramonium leaves	1 pound
Lard	3 pounds
Wax	½ pound

Boil the leaves in the lard till they become crisp, then strain through linen; afterwards add the wax, previously melted, and stir until cold. The present official process should be used, as it yields a more certain preparation than is obtained by boiling stramonium leaves with lard. Caspari, however, criticises the official formula, and says (Digest of Criticisms, U. S. P., 1890,) that the ointment should be made from the extract of the leaves and stems, as being more active than the seeds. The ointment will then also be green, which is preferred. Here is a formula for

Compound Stramonium Ointment.

Bitter sweet, bark of root;
Stramonium leaves,
Hemlock leaves,
Deadly nightshade leaves,
Yellow dock root, of each, two ounces.

Bruise the roots and leaves, and simmer them in alcohol; then add

Lard ....1 pound

and simmer gently till the leaves are crisped. Express through linen, and add

Venice turpentine ....2 ounces

Stir well together.

Symptoms and Treatment for Arsenical Poisoning.

(J. K.) Poisoning by arsenic is usually denominated as either acute or chronic, the diagnosis of the individual case depending upon the progress, severity and duration of the toxic effects. In cases of acute poisoning Hare describes arsenic as a gastro-intestinal irritant, producing, when taken in poisonous dose, violent vomiting and purging, with great pain in the œsophagus, stomach and entire belly. The passages are finally watery and resemble "rice-water" stools, but are to be separated from those of cholera and antimonial poisoning by the presence of blood, and, if necessary, by chemical analysis. The mucous membrane is stripped off the bowel and in the passages appears in shreds. Very commonly about the third day, if the patient survives so long, an intermission in the attack appears, which will only be followed by a return of all the symptoms, so that the physician must not give a favorable prognosis. In this symptom (remission) arsenical poisoning resembles phosphorus poisoning and yellow fever. Death generally occurs about the fourth or sixth day, and on or about the third day a peculiar skin eruption appears which may be of any character. In rare cases, says Hare, sudden pain, collapse, and death may take place after the ingestion of the poison. Widespread multiple neuritis may be brought on. A typical change always present in acute poisoning when the patient lives for any length of time is fatty degeneration of all the tissues.

Treatment of Acute Poisoning.—Besides washing out the stomach by the stomach pump, applying external heat and stimulants, the proper antidotes should be at once employed. The best one, and by some considered the only one of any value, is the official freshly-precipitated hydrated sesqui-oxide of iron and magnesia. After the use of the antidote emetics should be employed, opium be used to allay irritation and pain, and large draughts of water be given to flush the kidneys and dilute the poison. In the later stages the danger from arsenical poisoning arises from the changes produced in vital organs.

Chronic poisoning by arsenic shows itself in great irritation of the air-passages, in diseases of the kidneys, in pigmentation of the skin, and in nervous symptoms due to inflammations of the nervous tissues in different parts of the system, such as patches of anæsthesia and localized loss of motor power. These anæsthetic areas are generally confined to the extremities, and extend only to the first or the second joint above. Arsenic often produces asthma in those exposed to it by reason of the irritation it causes in the bronchial tubes. Chronic poisoning is to be treated by withdrawal from the exposure and the use of iodide of potassium to aid in the elimination of the arsenic. The other symptoms are to be treated by the application of electricity, tonics, out-of-door life, and such measures as will improve the general condition of the patient.

Legal Requirements for the Practice of Medicine.

(J. L. M.) The following information formulated by the National Conference of State Medical Examining and Licensing Boards at its 1895 meeting in Baltimore, shows very accurately the present requirements for the practice of medicine in each State of the Union:

A. States and Territories whose Medical Laws Practically Permit any one to Open an Office to Practice Medicine.

Alaska, Arizona, District of Columbia, Idaho, Kansas, Michigan, Nevada, New Hampshire, Texas, Wisconsin and Wyoming.

B. States and Territories which Merely Exercise a Supervision of the Diploma held by the Person Desiring to Practice Medicine.

California, Kentucky, Missouri and Nebraska.

C. States and Territories which Require an Examination for Licensure, but Accept the Diplomas of Certain Colleges as Evidence of that Examination.

Arkansas, Colorado, Connecticut, Illinois, Indian Territory, Chocktaw Nation, Iowa, Massachusetts, New Mexico, Oklahoma, Rhode Island, South Dakota, Tennessee and Vermont.

D. States and Territories that Require Passing an Examination before a State Board of Examiners before Issuing a License to Practice Medicine.

I. A Single Board of Examiners.

Alabama, Indian Territory, Cherokee Nation, Maine, Minnesota, Mississippi, Montana, New Jersey, North Carolina, North Dakota, Oregon, South Carolina, Utah, Virginia, Washington, West Virginia.

II. Two Boards of Examiners, one of them Homoeopathic.

Delaware, Florida, Louisiana and Maryland.

III. Three Boards of Examiners. One of them Homoeopathic, and another Eclectic.

Georgia, New York and Pennsylvania.

E. States from whom no Reply has been Received to Letters of Inquiry.

Indian Territory—Creek Nation.

In New York State, as noted above, there are three boards of examiners, Regular, Homœopathic and Eclectic, which hold examinations in January, April, May, June and September. The law compels examination in seven branches, three hours on each branch; three and one-half days are required. Fifteen questions are given in each branch, of which the candidate must select ten, and of this ten he must answer 7½—equal to 75 per cent. Failing in one topic, he must appear again, and is examined again, without extra cost, if his total average is over 80 per cent. If he fails in over one subject, he must wait six months and take the entire examination again without cost. But if he wishes to take the examination sooner he must pay an additional fee of $25.

The New York State Medical Examining Board, from Jan. 1, 1896, to Jan. 1, 1897, listened to 805 candidates, rejecting 23.7 per cent. (Indiana Medical Journal). Of the applicants, 723 were regulars, and 178 failed. Fifty-two came before the homoeopathic board and 11 failed. The eclectic board had 20 candidates and 2 failed.

See also this journal, Dec. 24, 1896, page 825.

TABLE OF SPECIFIC GRAVITIES OF U. S. P. PREPARATIONS.

	15°
Acid. aceticum, 36 per cent	1.048
Acid. aceticum glaciale	1.058
Acid. hydrobrom. dilut	1.077
Acid. hydrochloricum	1.163
Acid. hydrochlor. dilut	1.050
Acid. lacticum	1.213
Acid. nitricum dilut	1.057
Acid. phosphoric. dilut	1.057
Acid. sulphuricum	1.835
Acid. sulphuricum dilut	1.070
Aether	0.725—0.728
Aether aceticus	0.893—0.895
Alcohol	0.820
Alcohol absolutus	0.797
Alcohol dilutus	0.936
Amyl Nitris	0.870—0.880
Aqua Ammoniæ	0.960
Balsam, Peruvianum	1.135—1.140
Benzinum	0.670—0.675
Carbonei Disulphidum	1.268—1.269
Chloroformum	1.490
Creosotum	1.070
Glycerinum	1.250
Liq. Ferri Acetatis	1.160
Liq. Ferri Chloridi	1.387
Liq. Ferri Tersulphatis	1.320
Liq. Plumbi Subacetatis	1.195
Liq. Potassæ	1.036
Liq. Sodæ	1.059
Ol. Amygdalæ. express	0.915—0.920
Ol. Anisi	0.980—0.990
Ol. Cari	0.910—0.920
Ol. Caryophylli	1.060—1.067
Ol. Cinnamomi	1.055—1.065
Ol. Fœniculi	0.960
Ol. Lini	0.930—0.940
Ol. Menthæ piperitæ	0.900—0.920
Ol. Olivæ	0.915—0.918
Ol. Ricini	0.950—0.970
Ol. Sinapis volatile	1.018—1.029
Ol. Terbinthinæ	0.855—0.870
Spirit. Aetheris nitrosi	0.836—0.842
Syrupus	1.317

By F. DEITZE (Pharm. Rev.).

COCAINE IN OINTMENTS.—According to the Phar. Centh., the cocaine salt should first be dissolved in as small a quantity of water as possible, then incorporated well with some lanolin, finally mixing with the ointment vehicle, as petrolatum or **lard.**

THE PHARMACEUTICAL ERA

[*WEEKLY.*]

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Our subscribers do not need to be reminded of the desirability of preserving their copies and keeping their files of The Era complete. We reserve of each issue a limited number of copies to supply orders from subscribers who have neglected to keep their files complete. Our supply of these back numbers is becoming rapidly depleted, and old subscribers are particularly requested to let us know soon of any back numbers which they may require for completing their files. With each successive year the value of a complete file of Eras is sure to be enhanced.

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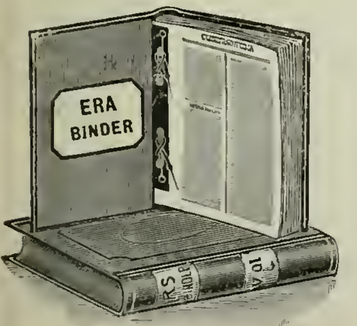

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AN EPOCH FOR ERA READERS.

THE ERA COURSE IN PHARMACY.

Announcement.

The management of the Pharmaceutical Era has great pleasure in announcing that its special plan for supplying its readers with a complete course in the study of pharmacy, which it has had in contemplation for a long time, is being brought to a successful issue, and will soon be in full operation. The plan, in brief, is to furnish to Era readers, especially the drug clerks and boys who are just beginning their drug career, a select course of lectures by eminent pharmaceutical educators upon the several subjects commonly included in the curriculum of the colleges of pharmacy, the course to be so arranged and conducted as to afford a graded, systematic and comprehensive course of study in the theory and practice of pharmacy.

The execution of the plan will be in charge of Professor J. H. Beal, who will be assisted by a corps of teachers of large experience, qualified by long acquaintance with the necessities and difficulties of students, and will be carried out in strict accordance with modern educational methods.

The objects of the undertaking are: (1) to furnish a thorough preparatory course of study for those.who are expecting to enter upon a college course in pharmacy; (2) to supply a valuable auxiliary for students already engaged in college work, and (3) to afford a comprehensive and economical system of home study for drug clerks who may be unable to attend college. The course of study will, moreover, be projected along such lines as to make it of practical value to advanced students as well as beginners, as a review for experienced pharmacists and graduates from pharmaceutical schools, and of importance to all who are connected with pharmacy in any capacity.

As an addition to the lectures which will present systematically the fundamental principles of pharmacy, chemistry and materia medica, there will be presented a series of papers upon topics of every-day importance in the drug store, which will be prepared by practical druggists of long experience. The regular work of the curriculum will cover a period of two years, to be known respectively as junior and senior. Both years will include two series of lectures of twenty weeks' length each, exclusive of the papers upon special topics by the special contributors.

As an encouragement to the earnest and systematic study of the lectures, a system of quizzes and written recitations will be conducted by competent quiz masters, while as a further stimulus to students to put forth their best endeavors a liberal list of prizes will be offered for those who exhibit the greatest proficiency in their work.

The lectures and series of papers will be printed in the regular weekly editions of the Era, and the quizzes and examinations will be conducted by mail direct with each student. The only additional expense to Era subscribers who wish to join these classes will be a purely nominal fee to cover the expense of examination blanks, postage, etc.

A general prospectus, containing a full outline of the various courses of study, and giving many other important details, is now in course of preparation, and will be furnished to all applicants. THE PUBLISHERS.

Carbolic Acid Label.

In view of the interest aroused by the recent circular issued by the Wayne County (Mich.) Medical Society regarding the proper label for carbolic acid and method of treatment of poisoning by this substance, it is very desirable that druggists adopt a label which shall be in accord with the recommendations offered. The following is proposed as the wording for such a label, to be altered as desired and printed in red:

CARBOLIC ACID.

POISON !

For External Use Only

◆◆◆

ANTIDOTE—Prompt treatment is necessary. Administer Sulphate of Magnesium or Sulphate of Sodium. (Syrup of lime is also good.) Alkalies, soap, albumen, flour and water may be given. The stomach should be washed out with a stomach pump.

Do Not Administer Oils,

Counteract collapse by hypodermic injections of atropine, by hot applications, arterial stimulants and friction. Small doses of Epsom Salt should be given for several days to remove the poison from the system.

KNIGHT & DAY

DRUGGISTS.

This is offered simply as a suggestion of what is desirable. If the drug trade has been wrong all this time in recommending the administration of oil in carbolic acid poisoning, it is time to counteract the evil effects of this advice so far as possible by instructing the public in the proper method of treatment. Every bottle of carbolic acid sold should bear a label giving plainly and fully the proper procedure to follow in emergency cases. Carbolic acid, because of its popular, household use, is a more than ordinarily dangerous poison, and all precautions should be observed against its misemployment.

Pharmacy Law Exceptions.

This title is hardly an appropriate one for the few remarks it is desired to make, for to be strictly indicative of our purpose the title would have to be amplified to the extent of the remarks themselves. We wish merely to call to notice a provision in a recent enactment in this Empire State, and to a particular paragraph in that enactment, to which our caption may most appropriately apply.

The other day there was signed by the Governor of the State of New York a bill entitled, "to Amend the Public Health Law in Relation to the State Board of Pharmacy." With the general provisions of this bill, introduced by Mr. Brush, of New York, druggists are very thoroughly familiar, and it needs no discussion here. But the paragraph taken for notice embodies features which came into prominence during the consideration of what was termed the "Higbie bill," and applies to the sale of drugs and medicines by other than duly qualified pharmacists. It will be remembered that some months ago the State Board of Pharmacy called attention to the very dangerous provisions in the Higbie bill, and by much activity, voluminous correspondence, etc., succeeded in sidetracking the dangerous legislation, and secured a compromise which is set forth in the following paragraph of the act just passed:

"187. Application of Article Limited.—This article shall not apply to the business of a practitioner of medicine who is not the proprietor of a store for the retailing of drugs, medicines or poisons, and shall not prevent practitioners of medicine from supplying their patients with such articles as they may deem proper, nor shall it apply to persons who sell medicines or poisons at wholesale, or to the sale of paris green, white hellebore and other poisons for destroying insects, *except in cities of the first class*, or any substance for use in the arts, or to the manufacture and sale of proprietary medicines, *or to the sale by merchants of ammonia, bicarbonate of soda, borax, camphor, castor oil, cream tartar, dye stuffs, Epsom salts, essence ginger, essence peppermint, essence wintergreen, glauber's salts, glycerin, licorice, olive oil, rochelle salts, sal ammoniac, saltpeter, salts of tartar, sal soda and sulphur*, or to the sale of the usual domestic remedies by retail dealers in the rural districts. The term 'usual domestic remedies,' here employed means medicines, a knowledge of the properties of which and dose has been acquired from common use, and includes only such remedies as may be safely employed without the advice of a physician, such as (Epsom salts, rochelle salts, salts of tartar, borax, sulphur), paregoric, magnesia (camphor), aloes, myrrh, guaiac, arnica, rhubarb, senna, squills, ipecac and preparations of same (castor oil, olive oil, origanum, spike, amber, wintergreen, peppermint, wormwood, glycerin), spirits of niter, *essence anise* and other like remedies, but does not include opium, morphine, laudanum, strychnine, arsenic, belladonna, aconite and other poisons requiring knowledge and pharmaceutical skill to safely dispense, unless they are sold in original packages, or in packages *put up by*, and bearing the label of a licensed pharmacist. The term 'rural districts,' here employed, shall apply only to small villages and country districts having no store where pharmacy is practiced. The term 'practice of pharmacy,' when used in this article, means the compounding of prescriptions, or of any United States pharmacopœial preparation, or of any drug or poison, except as provided for in this section."

In explanation of the above it may be said that the matter *in italics* is new, while the matter in parentheses is the old law, which it omitted. It is plain, then, that this is really only a half-way measure, but it is much preferable to the Higbie proposition, as at first presented, and on the principle that "half a loaf is better than no bread," we take it and are thankful.

Registration of Poison Sales.

Tennessee now has a new law, or rather an amendment of an old law regulating the sale of poisons and the adulteration of medicines. It owes this improved legislation, for it is an improvement, to the efforts of the State Board of Pharmacy.

On a principle which seems to obtain in very many States, Tennessee was cursed by a law which would look after the health and well being of its inhabitants in only such towns as numbered more than 3,200 souls. It apparently did not make any difference whether individuals in the country, or in the smaller hamlets and villages, should have adulterated foods and experience no difficulty in the purchase of poisons. But, as remarked, the State now has a new law which, although not completely satisfactory, is a decided advance upon the old. It confides the sale of poisons and medicinal drugs to only such persons as are competent to handle them, and all sales of poisons must be duly registered, and every precaution in the way of accident and injury observed.

The special features of the law are immaterial for consideration here, where the purpose is merely to commend the activity of the Tennessee Board of Pharmacy, and to congratulate it upon its satisfactory achievement in the particulars cited.

Opposition to Taxing Mineral Water.

The medical journals of late are quite active in protesting against that section of the Dingley Tariff bill which would provide a heavy duty upon imported mineral waters, and we are told that petitions signed by many physicians are to be sent to the Senate and House of Representatives protesting against the proposed Dingley tax.

It is asserted that the proposed prohibitive tax on imported natural waters would deprive the public and the medical profession of the benefits now derived from these necessary and important resources of hygiene and medicine, because it would make them so high in price that their employment by poor people would be out of the question, and they would quickly assume the status of a luxury, rather than a necessity, which latter they really are.

This is only a single instance where certain private or general interests are affected by the tariff bill now under discussion. The man who most protests against the tariff, high or low, or its absence, is the man most closely affected in his finances by it. We would not attempt to say that American mineral waters are "just as good" as, and could be used in place of, the imported, for this would be substitution, some would say. Nor would we assert that artificial mineral waters are as good as the natural, even though we were sure that their chemical nature was identically the same.

Mineral waters have attained the dignity of a special department of hygiene and medicine, so that when we would enter upon a discussion of these points we quickly find ourselves floundering beyond our depth. But we would voice a sentiment of compassion for poor Mr. Dingley and his associates who are now going through such a deal of tribulation, in their supposed attempt to reconcile conflicting business interests for us all. If the United States really needs imported waters, and cannot replace them by something of our own production, then by all means don't prohibit a foreign article by placing upon it a tax so burdensome as to keep it out of the country. If these foreign waters are sui generis, let us have them by all means. We have lots of varieties in our own land which will do for everyday use.

Physicians Not Competent Pharmacists.

Pennsylvania druggists are at present much exercised over the possibility that physicians may acquire the legal right to register as pharmacists without passing an examination in pharmacy. A bill amending the pharmacy law to this effect is now before the Legislature, and stands a good show of passage. What makes it more exasperating is that pharmacists must stand examination. Doctors are deemed capable ex officio, but druggists who have devoted years to the study of pharmacy are not competent.

Any one who knows the relative value of the ordinary education in pharmacy and the training in a medical school will see the absurdity of this proposition, and it may be said that the better class of physicians in Pennsylvania desire no legislation of this character. It is only the men who cannot make a living at "doctoring" who try to get into pharmacy through the back door. Well-posted physicians know they are not competent to properly compound their own prescriptions and prefer to leave this duty to the pharmacist. The Alumni Report has been trying to show the absurdity and injustice of the proposed law, and has built up a strong case against it. It has done this by the testimony of medical men themselves. In a series of questions it propounds to a well-known physician, the following two, with the doctor's replies, are particularly significant.

Would you not say that there is practically no pharmacy taught in medical schools?

Answer.—I certainly should.

It is not probable that the largely increasing use of so-called "pharmaceutical specialties" is due to a lack of pharmaceutical knowledge among the members of the medical profession, who are in the habit of prescribing these proprietary remedies?

Answer.—I am sure of it, but I pursue a different course in my own practice. Once determined upon what to prescribe, I have only found it necessary, if in doubt about its pharmaceutical combinations, to apply to a friendly and capable pharmacist, with a result satisfactory to myself and my patient, whose pecuniary interests were largely protected by so doing.

With this admission by themselves that they know little of pharmacy, it is obvious that physicians should not be given the privilege prayed for in the bill.

But we cannot close these remarks without a passing consideration of the second reply quoted above. In it is embodied a principle which, if generally acted upon by the medical fraternity (as it should be), would relieve the doctors of the just charges made against them of ignorance and incapacity, and at the same time remove from the pharmacist's shoulders a burden under which he has long and painfully staggered.

Let the doctor depend on the druggist for his pharmacy and pharmaceutical combinations, and the result will be to his personal and professional satisfaction. The druggist is abundantly able to prepare medicines in desired combinations and elegant form, and the doctor need not depend upon the mysterious concoctions, trademarked, copyrighted, eth-pharmacal, whatever they be, which specialty houses load them up with and which are generally claimed to be better than anything else on earth that any one else on earth can possibly produce. Give the druggist a show, and he'll not disappoint you.

Correspondence.

We are pleased to publish here communications from our readers on topics of interest to the drug trade. Writers are requested to express their views as briefly as possible. Each article must be signed by its writer, but his name will not be published if so requested.

Answer to "Happy Harry, '93"

To the Editor: Having read the article, signed as above, in your issue of April 22, I feel constrained to ask this gentleman if he is speaking for himself alone, or as the mouthpiece of the Retail Druggists' Association? I should feel loath to believe that, as a body, these gentlemen believe that dishonesty is the best policy. The manufacturers of proprietary articles are an upright, honorable class of men, who have spent years of effort, and spared no expense, in perfecting their goods, thereby assuring the public of an honest article for their money. The dishonest retailer who prepares and offers a nostrum as a substitute for such goods, is a person unworthy of confidence, or trust. He it is who plunders the public and causes people to lose all faith in the honesty of their fellow man. Happily the intelligent people of this great land are becoming educated to an understanding of this type of humanity, and appreciate the fact that the dealer's artifices are not conducive to the good health or pecuniary welfare of the customer, but in all instances to increase their own profits at the expense of a meritorious article.

PROPRIETARY.

Physician-Pharmacist: Alcohol Tax.

Sublette, Lee County, Ill., April 12, 1897.

To the Editor: Upon general principles I do not believe in the "Physician-Pharmacist."

The physician or pharmacist who keeps thoroughly posted in matters pertaining to his own profession, and keeps abreast the general thought of public events, at the same time answering the demands that local society make upon him, will have enough to do, without trying to "carry double."

But in most small cities and country places the ranks of the doctors are crowded, and they have to resort to various expedients to keep up appearances and make ends meet. Hence most of these physicians carry saddle bags full of medicines, which I think is all right in country places, and fill their own prescriptions, expecting the druggist to supply them with part of the ingredients at about cost, or they sell medicines outright. The druggist has a right to do counter-prescribing, in such cases, to sustain his business.

I am opposed to the "infernal" revenue tax upon alcohol, when used for strictly scientific purposes. It is also an outrage upon the respectable druggist to place him on a level with the dram-shop keeper, and make him pay an annual tax of $25. The principal reason why any druggist wishes to be compelled to pay $2 a gallon tax on alcohol is, so far as I have heard, it gives the wealthy druggist an advantage over his poorer competitor. He can buy alcohol in lots of one to five barrels. His less fortunate neighbor can buy only five or ten gallons at a time, which makes it cost him ten or fifteen cents a gallon more.

My home business has never been reasonably remunerative. During the last fifteen years I have sold specialties to most of the druggists within twenty-five miles of me. A majority of these seldom buy more than ten gallons at once. The advocates of the tax are the "big fish," who wish to devour the smaller ones.

JACOB B. BARTON, M. D. and Pharmacist.

(Special Correspondence.)

THE LAND OF PERFUMES.

An Afternoon at Grasse.

Grasse, France, Feb. 28.—King Carnival asserts his noisy sway to-day all along the Riviera, but I wanted a quiet Sunday. "Go to Grasse," advised a friend at Cannes, and "in forty minutes you will be 'far from the madding crowd.' And if you have nothing to do this Saturday afternoon, come with me and visit one of the perfume factories there."

An hour later, as the little train jogged its way leisurely up the steep twelve miles that separate the two towns, my companion pointed out the favored position of the town, which is the principal center of the raw perfumery trade of Europe. The mountains in the North protect from the cold winds the sloping land that stretches seaward, and the southern aspect and Mediterranean sunshine make this spot particularly suitable for flower cultivation. We could see numerous plots of jasmine, laid out in rows divided by trenches, but now withered; and occasionally violets were visible clustering under the olive groves—they cannot stand the full glare of the sun. But, as a rule, the floral world is conspicuous principally by the absence of its chief ornaments. "Every flower is picked and sold," I was told; "the very wild flowers form projectiles for the 'Battle of Flowers.' "

View Of Grasse.

The town itself is quaint and picturesque, with steep and narrow streets that were evidently planned in medieval days. "We Cannes folk say that the Grasse people export their perfumes, but keep all their evil smells for home consumption," remarked G., as we passed a heap of perfumery factory refuse. Several of these factories in the older part of the town, I noticed, are installed in ancient convents and hospitals; one of the buildings had evidently once been a chapel. Around the works clustered a legion of tinsmiths' and coopers' shops, where one heard the busy adze and hammer shaping receptacles for the various goods; while the coppersmiths constructed and repaired large alembics and similar apparatus.

The factory we visited, if not immense, was complete and interesting; our guide was, I understood, the manager of the establishment. It was the violet season now, he told us, and there was a very fair crop this year. The flowers are brought daily to the manufactory by the peasants who have made contracts to supply the firm. Twenty years ago there was little but mule-paths, and the blossoms were carried in paniers on donkeys, but excellent roads now exist for wheeled traffic.

The Parma violet is the one used in perfumery, giving, as it does, the highest percentage of perfume. The flowers, after being carefully picked from the stems, are thrown into a vessel containing pig's lard and a little suet. About four pounds of violets go to one pound of fat; for jonquils, marguerites and cassia the proportion is about the same; but in the case of orange flowers twelve pounds are necessary. After standing an hour or so, the receptacle is placed in a water bath heated by steam to 60 degrees. The mixture is stirred for about twenty minutes and then strained through a sieve. The flowers are then wrapped in packets and placed under an hydraulic press, the liquid which is then pressed out runs into the vat, into which a new supply of flowers is thrown, and this process continues till the whole mass is thoroughly impregnated with the odor.

To prepare the "extracts," the pomade produced as above described is mixed with an equal quantity of cold alcohol at 95 degrees, and turned by steam machinery for about three days. The liquid is then drawn off, and the fat sold to soap makers. To avoid oleine, the alcohol is artificially refrigerated by a freezing machine.

"If you want to see us busy, and also to see the beauty of the flower district, you ought to come in May or June," added the manager. "The whole valley is then one mass of roses. Yes, we grow on dwarf bushes, so as to obtain the maximum of flowers. The yield averages nearly one-half pound of roses to the square foot. We use the pink flower known as the 'Rose de Mai' for perfumery. The stalks are cut off and the pistils carefully extracted; we use the petals and the stamens; these latter are especially rich in odor."

And he pointed out the huge copper alembics devoted to the distillation of otto of roses, to produce one pound of which some eight tons of roses are required. This product sells for about $200 or $250 per pound. "No, I don't think the Bulgarians can touch our quality," he added. "Their otto sells, if I remember rightly, for about half the price of ours."

Neroly is produced in the same way, from orange flowers; it takes about a ton of these bridal blossoms to produce a kilo of the essence, which is worth about $100. These are the flowers of the Bigarrade orange, largely cultivated in the Riviera. The skin of the same fruit is much used for making "bitters."

A Grasse Peasant Family.

Next door were the apparatus for the "cold" process employed for jonquils and jasmine. These flowers are simply spread on sheets of glass thinly coated with grease, and the sheets subsequently placed in wooden frames which, piled one upon another, practically form an air-tight case. The flowers are replaced daily till the fat is thoroughly impregnated. Jasmine and tuberose are sometimes changed ninety times, while twenty to twenty-five renewals suffice for jonquils.

But Grasse does not confine its industry to home products. Patchouli and sandalwood are imported from India. "These bales arrived late, having come from Bom-

Peasants Picking Jasmine.

bay; they were refused at Marseilles because of the plague, and made the journey to Liverpool and back here," I was told. The plague scare has probably done much harm to French commerce.

There was orris root, too, which comes from Florence, but will probably be successfully cultivated in the Vosges or Dijon districts soon, my guide informed me.

The "concentrated extracts" prepared for countries like Russia, where the customs duties are heavy, were then shown to us—they were almost solid. "Ten grammes of this jasmine," said the manager, "will make a liter of 'Triple extract.' "

This terminated our visit, but a few additional facts and figures may be interesting. Besides the factories of Bruno-Court and Chiris (both of which Queen Victoria visited during her season at Grasse in 1891), Roure-Bertrand, Pilar Freres, Sozio and Andrioli, Muraour, Faye, Belandon and twenty or thirty other firms whose names I forget, have establishments of more or less importance. The annual value of perfumery exported is calculated at nearly five million dollars. The town also contains large factories for crystallized fruit and olive oil, and soap is made to a certain extent.

"Quite a hive of industry," I said. "But are these people really French, or Italians, like the Nicois?"

"Grasse was French two hundred years ago," I was informed, "but probably 50 per cent. of the workers are Piedmontese."

"What do they earn?"

"Not much. The tinsmiths, etc., may make 75 cents a day, but in the factories 50 cents per diem for the men and 25 or so for the women, is about the average; they make overtime in busy season."

"And how do they live?"

"Frugally and carefully, half of them put a trifle in the Savings Bank annually. A family lives in a single room at 25 cents a week rent; meat is a luxury for Sundays."

"This low pay," I remarked, "enables Grasse to hold her own."

"Yes," said G——. "I may add they are hard workers, and keen business men. Historians pretend there is Phœnician, Greek and Jew blood in their veins. The town is prosperous, and the wealthy manufacturers want no tourists to spoil their people; building land is scarce and attractions few. Catherine de Medicis sent a Florentine to open a perfume laboratory at Grasse centuries ago, and it is quite possible the trade may stay for centuries yet."

——The drug stock of Evans Brothers, at Claremore, I. T., was advertised for sale to the highest bidder, on the 17th.

A FINANCIAL DIGEST

of the Retail Drug Trade of the United States.

The following digest of the financial responsibility of the retail druggists has been compiled from the Office Records of the Era Druggists' Directory (Fifth Edition, April, 1897). Besides showing the number of druggists in each State, it indicates their financial responsibility as given by DUN and BRADSTREET. The Table is self-explanatory and will be of special interest to all firms in the trade.

CLASSIFIED LIST OF RETAIL DRUGGISTS BY THEIR FINANCIAL RATINGS.

New England States.	Rated $3,000 or above.	Rated $2,000 or above.	Rated $1,000 or above.	Rated less than $1,000.	No financial rating.	Total No. of druggists.
Connecticut	228	46	53	97	19	443
Maine	157	42	55	145	18	417
Massachusetts ..	556	154	157	593	99	1,559
New Hampshire.	94	30	22	65	17	228
Rhode Island ...	82	16	19	82	19	218
Vermont	82	25	25	57	8	197
	1,199	313	331	1,039	180	3,062
Eastern States.						
Delaware	49	4	12	36	4	105
Dist. Columbia ..	76	18	17	66	28	205
Maryland	165	60	98	185	49	557
New Jersey	316	87	94	244	50	791
New York	1,551	403	308	790	402	3,454
Pennsylvania ...	1,308	415	312	724	193	2,952
	3,465	987	841	2,045	726	8,064
Middle States.						
Illinois	1,258	318	305	698	240	2,819
Indiana	619	244	275	670	103	1,911
Iowa	649	280	188	389	86	1,592
Kansas	406	155	153	347	41	1,102
Michigan	574	168	175	560	103	1,580
Minnesota	308	121	82	238	37	786
Missouri	788	225	287	708	211	2.219
Nebraska	313	116	113	201	40	783
North Dakota ...	63	21	13	68	18	183
Ohio	980	288	286	462	143	2,159
South Dakota ...	123	32	31	83	8	277
Wisconsin	411	105	83	146	49	794
	6,492	2,073	1,991	4,570	1,079	16,205
	Rated	Rated	Rated	Rated	No	Total
Far Western States.						
Alaska	..	1	..	3	..	4
Arizona	27	2	4	10	3	46
California	362	80	75	238	92	847
Colorado	164	49	25	65	40	343
Idaho	30	6	12	25	7	80
Indian Territory.	33	9	27	90	17	176
Montana	49	13	11	14	6	93
Nevada	13	..	3	11	..	27
New Mexico	22	5	5	9	6	47
Oklahoma	29	18	19	38	8	112
Oregon	102	23	35	69	24	253
Utah	29	14	6	33	11	93
Washington	87	25	37	97	16	262
Wyoming	20	7	2	7	1	37
	967	262	261	709	231	2,420
Southern States						
Alabama	119	45	54	144	10	372
Arkansas	135	48	86	240	31	540
Florida	70	27	29	127	18	271
Georgia	199	75	74	170	45	563
Kentucky	371	113	137	292	41	954
Louisiana	164	42	47	124	25	402
Mississippi	124	54	70	137	13	398
North Carolina ..	133	28	34	143	17	355
South Carolina ..	89	27	29	98	21	264
Tennessee	185	74	72	168	34	533
Texas	459	160	211	454	143	1,427
Virginia	143	42	42	154	23	404
West Virginia ...	102	32	27	54	14	229
	2,293	757	912	2,305	435	6,712
	14,416	4,392	4,336	10.668	2,651	36,463

——Louisiana's Governor has made the following appointments upon the State Board of Pharmacy: W. T. Taylor, A. C. Demonsobert, F. C. Godbold, of Orleans; G. S. Brown, L. F. Chalin, P. L. Vialon, Sr., Iberville; T. J. Labbe, W. Martin, R. T. Gibbs, De Soto, and C. M. Brooks, East Baton Rouge.

SEASONABLE SODA SPECIALTIES.

Almond Cream.[1]

Extract orgeat, S. & P.	½ ounce
Rose water	½ ounce
Syrup, enough for	1 quart

Mix. To 1½ ounces of this syrup in the glass add ½ ounce rich cream. Draw fine stream first to mix cream and syrup, then coarse stream to nearly fill the glass, and finish with fine stream. All cream syrup drinks should be drawn in this way.

Imperial Chocolate Syrup.[2]

J. H. Barker & Co.'s Cocoa	4½ pounds
Sugar	16 pounds
Gelatine (Gold Brand)	2 ounces
Water	2½ gallons

Dissolve gelatine in two pints of water, add chocolate and sugar, boil all together, and when cold strain and add extract vanilla six ounces. Then beat well eight eggs and add to above.

Pistache.[3]

Essence of bitter almonds	2 drams
Orange flower water	2 ounces
Fruit acid	1 ounce
Foam extract	1 ounce
Simple syrup	1 gallon

Color green with spinach.

Queens' Favorite.[4]

Shaved ice	½ tumblerful
Pineapple, raspberry and vanilla syrup	½ ounce each
Egg	1

Add milk enough to nearly fill glass. Shake well, fill glass with soda water, drawing fine stream. Grate nutmeg on top and serve.

Celery Egg Phosphate.[3]

Egg	1
Orange syrup	1 ounce
Pineapple syrup	½ ounce
Lemon syrup	½ ounce
Dashes of phosphate	3
Dashes of essence of celery	8

Add a little cracked ice, shake, strain, fill up with fine soda stream and throw from shaker to glass. Serve with nutmeg.

Egg Tonique.[2]

Egg	1
Moxocolo syrup	1 ounce
Root beer syrup	1 ounce
Angostura bitters, dashes	3

Shake with a little cracked ice, strain and throw. Serve grated nutmeg and cinnamon.

Use very little ice in egg drinks, and when drawing the soda use the fine stream only. Egg drinks to be palatable should be light and creamy.

Nerve Tonic.[2]

Syrup sarsaparilla compound	1 pint
Syrup ginger	8 ounces
Tincture gentian compound	8 ounces
Rock candy syrup	1½ pints
Liquid acid phosphate	½ pint
Caramel, enough to color.	
Water, enough to make	1 gallon

Kola Clnch.[2]

Fluid extract kola nut	2 fl. drams
Tincture cinchona, special	6 fl. drams
Fruit syrup, enough to make	3 pints

Tincture Cinchona Special:

Red cinchona, No. 60	6 oz. avoir.
Alcohol, 1 part.	
Rye whiskey, 2 parts, enough to make	2 pints

Fruit syrup:

Wild cherry phosphate syrup	4 pints
Vanilla syrup	1 pint
Orange syrup	1 pint
Lemon syrup	1 pint
Strawberry syrup	1 pint

Crushed, or Grated Pine Apple.[3]

Pine apples, large	4 to 6
Simple syrup	1 gallon
Sugar	4 pounds
Water	½ pint
Fruit acid	1 ounce
Foam extract	1 ounce

With a sharp knife remove the rough covering from the apples, and with an ordinary hand grater proceed to grate them, placing in a pan. Add the water and sugar, place on the fire for several minutes. Remove and allow to cool. Add the simple syrup, foam extract, and fruit acid, and mix well.

Crushed Raspberries—Strawberries.[3]

Berries	3 quarts
Simple syrup	1 gallon
Sugar	4 pounds
Water	½ pint
Fruit acid	½ ounce
Foam extract	2 ounces
Cochineal coloring sufficient.	

Remove the stems from the berries and rinse off the sand with cold water, place them in a cheese cloth bag, hold over a porcelain pan and proceed to crush with right hand, holding the bag firmly with the left, expressing the juice by crushing, then pour the pulp from the bag into the pan with the juice. Add the four pounds of sugar and the half pint of water. Place on the fire and allow to heat for several minutes, stirring well. Remove from the fire and allow to cool. Then add the simple syrup, fruit acid, foam extract and coloring.

Mint Cordial Frappe.[2]

Raspberry vinegar	4 ounces
Fruit acid	1½ ounces
Extract Jamaica ginger (or fluid ginger solution)	2 ounces
Tincture capsicum, 2 drams to	½ ounce
Brandy	4 ounces
Rock candy syrup	1 gallon

To serve, use 12-ounce glass. Take of above syrup about 2 ounces; fill glass with shaved ice; add three or four sprigs of fresh mint, and with mixing spoon press to side of glass to get flavor. Add more ice until glass is about two-thirds full, then fill with soda. Top off with a few sprigs of mint, and serve with straws.

Fruit Glace Syrup.[1]

To ounce of concentrated fruit syrup add one teaspoonful sugar and one tablespoonful cracked ice. Draw glass full of plain soda with large stream, stir quickly and pour through straining spoon into a thin glass containing a slice of the fuit, if pineapple, peach or orange, or a few sound, ripe berries, if small fruit.

Crushed Orange.[3]

Oranges	8
Sugar	5 pounds
Simple syrup	5 pints
Water	1 pint
Fruit acid	1 ounce
Foam extract	1 ounce

Peel the oranges, divide the sections, cutting them into small pieces and removing the seeds, place in cheese cloth bag and crush, expressing the juice into a pan, then add the pulp from the bag. Place the pan on the fire, adding the water and sugar. Stir and heat for several minutes. Remove from the fire, and when cold add the simple syrup, fruit acid, and foam extract, mixing well.

Claret.[3]

Claret wine	½ pint
Lemons, juice of	½ dozen
Oranges, juice of	⅙ dozen
Fruit acid	½ ounce
Foam extract	1 ounce
Cochineal color	15 drops
Simple syrup	1 gallon

Cinisaya.[2]

Tincture of detannated cinchona	6 ounces
Extract of vanilla	2 ounces
Alcohol	6 ounces
Rock candy syrup	8 ounces
Spirit of curacoa	2 drams
Distilled water, enough to make	1 quart

Mix and filter through carbonate of magnesia, and then color a deep red with carmine solution. Then add one quart of lemon syrup, and shake. Pour one ounce of cinisaya syrup into a mineral glass, and draw carbonated water in another glass. Mix thoroughly by pouring from one glass to the other, and serve.

Kola Fizz.[2]

Fluid extract kola	2 drams
Grape juice	8 ounces
Pineapple syrup	6 ounces
Fruit acid	1½ ounces
Syrup, sufficient to make	2 pints

Mix well.

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[1] Smith and Painter's Catalogue.
[2] Barker's "100 Fountain Formulas."
[3] Bonham's "Modern Guide for Soda Dispensers."
[4] Tufts' "Book of Soda Water Syrups."

Coca Tonique.[2]

Wine of kola	8 ounces
Wine of coca	4 ounces
Blackberry brandy	1 ounce
Lime juice	1 ounce
Raspberry juice (made from fresh fruit)	4 ounces
Rock candy syrup	8 ounces

Serve one ounce to a mineral glass, with a little ice.

Wine of kola is made from the fresh kola nut by percolating one ounce of it, ground, with ten ounces of sherry wine. Wine of coca is made by the same process as wine of kola, substituting the fresh coca leaves instead of the kola nut.

Moselle.[3]

Lemon juice	3 ounces
Vanilla extract	1 ounce
Essence of orange peel	1 dram
Wormwood bitters	1 dram
Essence of celery	30 drops
Foam extract	2 ounces
Caramel coloring	½ ounce
Simple syrup	1 gallon

Orange Sherbet (Dobyns').[1]

Vanilla syrup	1 pint
Pineapple syrup	1 pint
Orange syrup (from fresh fruit)	1 pint
Sherry wine	4 ounces
Grape juice	2 ounces

Dispense 1½ ounces in mineral glass with crushed ice.

Champagne Sherbet.[2]

California sherry wine	12 ounces
Acid phosphate dilute	5 drams
Citric acid	1½ drams
Rock candy syrup, to make	2 pints

Mix. Put two ounces in a 12-ounce soda glass, and shaved ice to half fill the glass; fill with plain soda and serve with a straw.

Plankinton Sorbet.[2]

Rock candy syrup ½ gallon, colored light red with carmine coloring; then add (cut in small cubes) the following:

One lemon,
Two oranges,
Two peaches,
Four bananas.

The lemon and oranges should be cut with the peel on.

Mix thoroughly and dispense. It is served plain, about two ounces to a glass, or with ice cream. The fruit should always be thoroughly mixed before dispensing. It is best served from a fruit bowl, with a large silver spoon.

Phosphated Sherbet.[4]

Diluted phosphoric acid	2 ounces
Citric acid	2 ounces
Granulated sugar	10 pounds
Sherry wine	1 gallon
Pure water	9 gallons

Mix and charge to 150 pounds.

Fruit Punch.[2]

Strawberry syrup	10 ounces
Orange syrup	10 ounces
Pineapple syrup	10 ounces
Lemon juice	2 ounces

Use one and one-half ounces of this to large glass one-third full of shaved ice, then fill glass with soda, add a few strawberries, slice of pineapple and slice of orange, and serve with straw.

Roman Punch.[1]

French brandy	4 ounces
Best Jamaica rum	4 ounces
Extract vanilla	¼ ounce
Fruit acid	¼ ounce
Syrup	1 gallon

Siberian Flip.[4]

Shaved ice	½ tumblerful
Orange syrup	1 ounce
Pineapple syrup	1 ounce
Acid phosphate	1 dram
Angostura bitters	2 drops

Shake well, and fill glass with soda water. Add a very thin slice of orange and pineapple, and serve with two straws in a 12-ounce glass.

Persian Sherbet.[3]

Raspberry syrup	1 quart
Pineapple syrup	1 quart

Mix. Take equal parts of oil of orange and citric acid, with enough alcohol to dissolve the oil, and put in a small bottle to be used the same as acid phosphates. To dispense draw one ounce of the syrup, add three shakes of the mixture and fill glass with soda. Use small glass.

Oxford Cordial.[2]

Elixir calisaya	16 ounces
Citric acid	½ ounce
Claret wine	16 ounces
Water	2 pints
J. H. Barker & Co.'s rock candy syrup.	1 gallon

Mix and serve in mineral water glass, with crushed or shaved ice.

Peach Blow.[3]

Peach juice	8 ounces
Raspberry juice	2 ounces
Lemon juice	2 ounces
Compound spirits of juniper	4 ounces
Foam extract	1 ounce
Cochineal coloring	½ dram
Simple syrup	3 quarts

Pineapple Cardinal.[1]

One ounce concentrated pineapple syrup, 2 teaspoonfuls Catawba wine, 1 teaspoonful powdered sugar, 1 tablespoonful cracked ice in mineral water glass. Draw half full of plain soda, using coarse stream, fill up with plain soda with fine stream and serve with straws.

Herculine.[2]

Tincture orange	2 ounces
Extract vanilla	2 ounces
Acid phosphate, dilute	4 ounces
Tasteless tincture of iron	4 ounces
Aqua flavus	4 ounces
Rock candy syrup, enough to make	1 gallon

Mix, color with caramel 1 ounce, and strain.

Use 1 ounce to 7 ounces of soda in a mineral glass, drawing soda first and stirring.

Windsor Spray.[2]

Syrup pineapple	8 ounces
Syrup strawberry	8 ounces
Extract vanilla	¾ ounce
Port wine	4 ounces
Rock candy syrup, quantity to make	4 pints

Mix. Use 1 ounce to mineral glass soda. Serve with straw.

"Sloan's Nectar."[2]

Extract vanilla	2 drams
Orange flower water	2 ounces
Rock candy syrup, to make	1 gallon
Carmine solution, quantity sufficient.	

Mix.

(Continued from Page 477, April 22.)

LIST OF REACTIONS AND REAGENTS ACCORDING TO NAMES OF AUTHORS.*

SCHEELE'S—Test for Arsenous Acid.—A solution of copper sulphate with excess of ammonia, which produces a pale green-colored precipitate with arsenous salts.

SCHEIBLER'S—Alkaloidal Reagent.—This is a solution of phospho-wolframic acid, which gives similar precipitates with the alkaloids as the phospho-molybdic acid solution (Sonnenschein's Reagent).

The reagent is prepared by dissolving 100 gm. of sodium wolframate and 60 to 80 gm. of sodium phosphate in 500 cc. of water, acidulated with nitric acid; or, according to Otto, the reagent may be made by adding phosphoric acid to a solution of sodium wolframate.

SCHELL'S—Test for Cocaine.—Hydrochloride of cocaine when triturated with calomel and then is slightly moistened by breathing over it a blackening occurs through partial reduction of the calomel.

Compare Lenz's test for pilocarpin.

SCHERER'S—Test for Inosite.—An aqueous inosite solution is evaporated almost to dryness with nitric acid, the residue moistened with aqua ammonia, adding a trace of calcium chloride and then again evaporated, a rose-red solution results.

SCHERER'S—Test for Leucin.—When leucin is cautiously evaporated to dryness on platinum foil with nitric acid and then the residue is warmed with a sodium hydrate solution, a yellow fluid remains, which, on further heating, forms oily drops.

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*From compilations of Dr. Altschul (Phar. Centralhalle).

SCHERER'S—Test for Phosphoretted Hydrogen.—This depends upon its reaction with silver nitrate paper. See Hager's Test.

SCHIFF'S—Cholesterin Test.—On adding ammonia to a mixture of cholesterin and concentrated sulphuric acid a red coloration ensues.

SCHIFF'S—Uric Acid Test.—An alkaline solution of uric acid reduces silver nitrate or silver carbonate. Filter paper is moistened with silver nitrate solution, followed by a little diluted solution of sodium carbonate and finally by the solution to be tested. If uric acid is present a black spot results.

SCHIFF'S—Test for Urea.—On adding furfurol and hydrochloric acid to a solution containing urea (urine) a violet color is produced followed later by the subsidence of an insoluble brown mass.

SCHIFF'S—Reagent for Aldehydes.—A solution of fuchsine-sulphurous acid.

See Guyon's Reagent.

SCHLAGDENHAUFFEN'S — Distinguishing Test Between Alkaloids and Glucosides.—The solution consists of a mixture of equal parts of a 3 per cent. alcoholic solution of guaiac and a saturated solution of mercuric chloride. Alkaloids only give a blue coloration with the reagent either in the cold or at 60 to 70° C.

SCHLICKUM'S—Arsenic Test.—The solution to be tested is carefully poured over a solution containing 0.02 gm. of sodium sulphite and 0.4 gm. of stannous chloride dissolved in 3 to 4 gm. of concentrated hydrochloric acid. If arsenic is present a yellow zone forms at the line of contact.

SCHLOSSBERGER'S—Distinguishing Test for Textile Fibers.—A concentrated solution of freshly precipitated moist nickelous oxide in aqua ammonia. This solution dissolves silk but not wool or cotton filament. Compare Persoz's Reagent.

SCHMIDT'S—Glucose Test Solution.—This is an ammoniacal solution of lead acetate which gives a brownish-red precipitate with glucose (in diabetic urine) on heating. Cane sugar does not reduce the solution.

Compare Rubner's Reagent.

SCHMIDT'S—Nitric Acid Reaction.—The fluid to be tested is mixed with a like volume of a solution containing 20 drops of anilin, 10 gm. of dilute sulphuric acid and 90 gm. of water, this mixture is carefully poured over concentrated sulphuric acid so as to form a layer above. If nitric acid is present a light to dark red zone forms.

SCHMITT'S—Test for Saccharine in Fluids.—The fluid made strongly acid is extracted three times with a mixture of equal parts of ether and petroleum ether. To the ethereal extracts a small quantity of sodium hydrate solution is added and the mixture evaporated afterward heating the residue for half an hour at 250° C. The fused mass is taken up with water, acidified with sulphuric acid and extracted with ether. If saccharine is present, salicylic acid will be found in the ethereal extract, which may be identified after the ether has been driven off by the addition of ferric chloride.

SCHNEIDER'S—Arsenic Test.—The arsenic present in the substance to be examined is removed as arsenous chloride by distillation with hydrochloric acid and ferrous chloride. The distillate is tested in a Marsh apparatus.

SCHNEIDER'S—Test for Cyanate in Cyanide of Potassium.—This depends upon the formation of the lasure-blue cobalt cyanate. Hydrocyanic acid is removed from the concentrated potassium cyanide solution examined by means of carbonic acid, then by the addition of alcohol the potassium carbonate formed is precipitated and the filtrate tested for cyanate by the addition of cobalt acetate.

SCHNEIDER'S—Test for Foreign (Cruciferous) Oils in Olive Oil.—To a solution of 1 part of the oil in 2 parts of ether, 5 cc. of a saturated alcoholic solution of silver nitrate are added. After standing for 12 hours in a dark place a blackening takes place if foreign (sulphurated) oils are present.

SCHNEIDER'S—Test for Bismuth.—A solution of 3 p. of tartaric acid and 1 p. of stannous chloride dissolved in sufficient of potassium hydrate solution gives, when warmed with a bismuth salt, a black precipitate.

SCHOENBEIN'S—Test for Blood.

See Almén's Reagent.

SCHOENBEIN'S—Test for Copper.—A solution of a copper salt gives a blue color on addition of potassium cyanide and guaiac tincture.

SCHOENBEIN'S—Ozone Test Paper.—This consists of filter paper which has been saturated with a clyster of 10 p. of starch, 200 p. of water and 1 p. of potassium iodide. In the presence of ozone a blue color is produced.

SCHOENBEIN'S—Test for Hydrogen peroxide.

See Boettger's Test.

SCHOENBEIN'S AND PAGENSTECHER'S—Test for Prussic Acid.—Strips of filter paper, which have been impregnated with a 10 per cent. tincture of guaiac, then dried and afterward dipped in a 0.1 per cent. solution of copper sulphate, are colored blue in presence of hydrocyanic acid.

Compare Payer's Test.

SCHOENVOGEL'S—Test for Distinguishing Animal from Plant Oils.—The latter, with exception of olive oil, form emulsions when shaken with a concentrated solution of borax. The animal oils separate under the same circumstances into two distinct layers on standing.

SCHOENVOGEL'S—Test for Foreign Fats in Butter.—6 cc. of a saturated solution of borax and 5 drops of the butter are shaken or warmed together at a temperature not higher than its melting point. Butter, beef and mutton suet do not emmulsionize, while all other fats emulsionize.

See Levin, Chem. Ztg., 1895, 1832.

SCHOTT'S—White Lead Test Paper.—A paper which is coated (by use of gelatin) with white lead and is used as an end-reaction test in triturating solutions of metals with sodium sulphide.

SCHOTTEN-BAUMANN'S—Reagent.—This is Benzoyl chloride. See Baumann's Reagent.

SCHROEDER'S—Test for Acetanilid in Phenacetin.—0.5 gm. of phenacetin is boiled with 6 to 8 cc. of water, cooled, filtered from the phenacetin that has crystallized out; the filtrate, after adding potassium nitrite and diluted nitric acid, is boiled, then follow with a few drops of Plugge's Reagent and boil again. If acetanilid is present a red coloration ensues.

SCHUCHARDT'S—Reagent.—This reagent is used in testing for the presence of hydrochloric acid in the gastric juice. It consists of a concentrated tropaeolin solution.

SCHULTZE'S—Cellulose Reagent.—A solution of 25 p. of dry zinc chloride and 8 p. of potassium iodide in 8.5 p. of water, adding sufficient iodine that it will dissolve on slight warming. This fluid colors pure cellulose blue.

SCHULTZE'S—Furfurol Test for Albuminoids.—A solution of antimony trichloride to an aqueous solution acid with a trace of sugar is warmed to 60° C.; a bright violet coloration ensues.

See Raspail's Test.

SCHULTZE'S.—Macerating Fluid.—This fluid, which is employed for isolating the cellular structure of plants, consists of nitric acid, to which some potassium chlorate has been added. The cellular structure of the plant is boiled in the mixture a few seconds and then the mixture is diluted with water.

SCHULTZE'S—Alkaloidal Reagent.—This is phosphoantimonic acid, which is prepared by adding slowly a solution of antimony trichloride to an aqueous solution of phosphoric acid, or by mixing a saturated solution of sodium phosphate with 1 p. of antimony chloride. In the presence of dissolved alkaloids the reagent produces a white precipitate like the closely related phospho-wolframic acid and phospho-molybdic acid.

Compare Jungman's, Scheibler's, Sonnenschein's and de Vry's Reagents.

SCHULZ'S—Salicylic Acid Test.—A neutral solution of salicylic acid gives with copper sulphate a green coloration.

SCHUMPELITZ'S—Reagent for Veratrin.—A solution of fused zinc chloride in dilute hydrochloric acid. On evaporating a few drops of this reagent with veratrin to dryness a red coloration ensues.

SCHUSTER'S—Test for Coloring Matter in Beer.—Through the addition of a solution of tannin to a sample of pure beer, decoloration takes place, while if caramel is present no effect is produced.

SCHWARZ'S—Sulfonal Test.—On heating sulfonal with charcoal mercaptan is evolved.

SCHWARZENBACH-DELF'S — Reagent.—This is potassio-platinous-chloride.

SCHWARZENBACH-DELF'S—Alkaloidal Test.—On treating alkaloids with nitric acid. followed with aqua ammonia, in many instances characteristic color reactions are obtained.

SCHWEISSINGER'S—Test for Alkalies.

SCHWEITZER'S—Test for Soaps in Lubricating Oils.—The reagent is a saturated solution of metaphosphoric acid in absolute alcohol. On adding the reagent to an etheral solution of the oil to be tested a precipitate is obtained if soap is present.

SCHWEITZER'S—Reagent for Distinguishing Textile Fibers.—Freshly precipitated and washed cupric hydrate or carbonate is shaken with 20 per cent. spirits of ammonia till a saturated solution results. This reagent dissolves cotton, linen and silk fibers, but not wool. It also serves as a microscopic reagent for cellulose, which is rapidly dissolved while lignin is not affected. This reagent, can, according to Wiesner, be prepared by allowing copper turnings to stand in contact with 13 to 16 per cent aqua ammonia in an open flask.

SEEGEN'S—Test for Diabetic Sugar.

See Trommer's Test.

SEIDEL'S—Test for Inosite.—The solution is evaporated to dryness with nitric acid and the residue moistened with a solution of strontium acetate. Inosite gives a violet color.

SELMI'S—Alkaloidal Reagent.—Obtained by diluting a saturated solution of iodic acid in concentrated sulphuric acid with 6 volumes of sulphuric acid.

Another alkaloidal reagent proposed by Selmi is a solution of lead chloride obtained by dissolving lead peroxide in concentrated hydrochloric acid.

SELMI'S—Test for Blood.—The spot to be tested is extracted with aqua ammonia, filtered, the filtrate precipitated with sodium wolframate and acetic acid; the precipitate after washing is treated with a mixture of 1 volume of aqua ammonia and 8 volumes of absolute alcohol, filtered, the alcohol is evaporated off and the remaining fluid treated with sodium chloride and acetic acid. If blood is present microscopic crystals of hæmin can be detected.

SILBERMANN'S — Albumin Test. — Albuminoids which have been deprived of fat give a violet color on heating with fuming hydrochloric acid.

(To be Continued.)

——The Committee on Entertainment has decided upon the following dates for the annual meeting of the New York State Pharmaceutical Association to be held at Manhattan Beach: July 13, 14, 15 and 16, 1897.

EXAMINATION QUESTIONS, NEW YORK COLLEGE OF PHARMACY.

The following are some of the examination questions propounded this spring to the members of the Junior, Senior and Post-Graduate classes of the New York College of Pharmacy. They relate to but one or two branches of study in which the students must be examined, and are presented merely to give an idea of the character of the examinations:

JUNIOR PHARMACY.

1. What is the weight in grains of a fluid drachm of water at 59° F?

2. A substance weighs in air 322.5 grains; it displaces 5 c. c. of distilled water. What is its specific gravity?

3. What is the object of placing chloride of calcium inside the case of a balance?

4. Convert a) 69° F. into °C. c) 960.5° F. into °C.
b) 89° C. into °F. d) 175.75° C. into °F.

5. What volume expressed in fluid ounces, will 3 kilogrammes of a liquid having a specific gravity of 1.250 occupy?

6. How does distillation differ from sublimation?

7. Name three salts that are very soluble in water.

8. What is a reflux condenser? State why it is employed.

9. State what influence the temperature and density of a solution have, on the size of crystals deposited from it.

10. How may immiscible liquids be separated?

11. You are required to filter tincture of myrrh; With what liquid would you wet the filter, and why?

12. Why is alcohol added to the finished preparation of a drug whose active principle is soluble in water?

13. State how you would ascertain whether drugs containing the following constituents have been exhausted by a menstruum:
   a) An alkaloid.
   b) A resin.
   c) Coloring matter.
   d) Tannin.

14. What is an emulsion? Name three varieties.

15. What is the difference between emulsification and saponification?

16. How would you dispense a compound powder containing chloral and camphor?

17. State what definite relation, if any, there exists, between the drug and the finished preparation, in the case of:
   a) Fluid Extracts.
   b) Extracts.

18. Why should infusions not be made from fluid extracts?

19. Is the color, specific gravity, or quantity of extractive, any criterion of the value of a pharmacopœial fluid extract or tincture? If not, state how the strength of such a preparation can be ascertained.

20. Give the essential distinction between:
   a) Wines and Tinctures.
   b) Liquors and Spirits.
   c) Spirits and Medicated Waters.

21. Name three official preparations containing ammonia gas. State % of gas in each, and state to which classes of galenical preparations they belong.

22. Name three arsenical liquors, stating % of active constituent in each.

23. In the manufacture of precipitated sulphur, why is the yield larger when sulphuric acid is used instead of hydrochloric acid?

24. State what poisonous impurities are liable to occur in phosphoric acid, and how they may be detected and removed.

25. What difference in behavior is noticed in case of tincture of iodine and Lugol's solution upon the addition of water, and give reason for such difference if any.

26. Describe in detail the U. S. P. method for making an infusion.

27. State why sugar and myrrh are used in preparing Griffith's mixture.

28. What reaction occurs in a mixture containing syrup of squills and bicarbonate of sodium?

29. If a medicated water containing a volatile oil caused a precipitate to form when mixed with syrup of iodide of iron, to what would you attribute the phenomena?

30. How is "Cold Cream" prepared?

SENIOR PHARMACY.

1. Why is nitric acid employed in the preparation of "Liquor Ferri chloridi," U. S. P.? What is the strength of the acid you would employ?

2. State how you would determine the amount of absolute acid present, in a sample of acetic acid. State why the density of such acid is no criterion of its strength.

3. State how the solubility of the following substances, in water, may be promoted:
   a) Iodine.
   b) Saccharin.
   c) Corrosive Sublimate.

4. Give the unabbreviated official title for:
   a) Red Precipitate. d) Phenyl Salicylate.
   b) Pulvis Purgans. e) Ferruginous Pills.
   c.) Hive Syrup. f) Court Plaster.

5. Why is potassium hypophosphite used in making the official syrup of hydriodic acid?

6. Name four official preparations containing ferrous carbonate, giving in each case the full official title.

7. What changes occur in the preparations of rhubarb which have been subjected to a high temperature; and how do such changes affect the medicinal value of such preparations?

8. Why is acetic acid employed in the official preparations of conium?

9. Give in detail any method employed for extracting alkaloids from drugs.

10. Give a test whereby you would ascertain whether a sample of natural oil of bitter almonds had been deprived of one of its constituents.

11. Name three methods by means of which volatile oils are obtained.

12. An old sample of oil of turpentine contains crystals, what is their probable identity?

13 Name three official volatile oils:
a) Which are heavier than water.
4) Which contain eugenol.

14. Why is ammonia water used in preparing aromatic spirits of ammonia?

15. How would you detect glycerine as an adulterant in lactic acid?

16. Give characteristic reactions for:
a) Caffein.
b) Quinine.
c) Atropine.
d) Strychnine.

17. How does sapo mollis differ from sapo, chemically and physically?

18. State what products are formed, when cane sugar is heated to 160°C. and allowed to cool, and when it is heated 200°C. or over.

19. How would you ascertain whether or not a volatile oil had been deprived of its stearopten?

20. What constituent of crude carbolic acid is absent in carbolic acid, U. S. P., and what bearing has this on the disinfectant properties of the acid?

21. What oils may be obtained from black mustard? State how they are obtained.

22. Give in detail a method for preparing scale salts.

23. Chloroform; give tests of identity; name the impurities that may be present; give tests for these impurities, and name its official preparations.

24. Under what titles is alcohol official? State per cent. by weight of absolute alcohol in each instance.

25. Into what official preparation does ethereal oil enter; and how would you detect its absence from this?

26. What would you do if you had spilled a considerable quantity of "Spiritus Glonoini?"

27. What happens to chloral when exposed to the atmosphere?

28. How would you determine the absence of chloral alcoholate in Chloral U. S. P.?

29. Name the official preparations into which tartar emetic enters, stating the per cent. in each case.

30. A pharmacist has on hand two lots of powdered opium containing respectively 8% and 18% of morphin. He desires to prepare 100 c. cm. of tincture of opium U. S. P. How many grammes of each lot may he employ?

31. State the difference in appearance and composition of "German" and "French" digitalin.

32. Give an outline of the official assay for Tinctura Opii U. S. P.

33. You desire to prepare sulphate of atropin from atropin; how would you proceed?

34. Tartaric acid; source, how obtained, kinds of salts it forms, and three tests of identity.

35. How would you distinguish Monsel's solution from solution of ferric sulphate; and state what you would dispense, if Liq. Ferri. Persulph. were called for.

SENIOR DISPENSING PHARMACY,

1. You are required to dispense hurriedly antidotes for the following poisons:
a) Paris Green.
b) Oxalic Acid.
c) Iodine.

What would you dispense? and in the case of (a) give details of how you would prepare the antidote.

2. You wish to dispense 16 fluid ounces of a 1-1000 solution of bichloride of mercury, and have on hand a solution containing 15 grains in each fluid ounce. How much of the latter must you employ? You may assume that the solution has the same density as water.

3. Write a prescription for an emulsion of Terebenum, each teaspoonful to contain an adult dose.
a) In the metric system to measure 100 c. c.
b) In the apothecaries system to measure ℥ iii fld.

4. What changes occur when the following are brought together:
a) Camphor and Thymol.
b) Syrup of Iodide of Iron and Fowler's Solution.
c) Calomel and Lime Water.
d) Lime Water and Chloral.
e) Subnitrate of Bismuth and Sodium Bicarbonate.
f) Potassium Iodide and Tincture of Chloride of Iron.
g) Calomel and Potassium Iodide.
h) Antipyrin and Tincture of Ferric Chloride.
i) Tinct. Cinchona Co. and Donovan's Solution.
k) Potassium Chlorate and Syrup of Iodide of Iron.
l) Collodion and Ammonia Water.
m) Acetate of Lead and Tincture of Opium.
n) Nitrate of Silver and Hydrochlorate of Cocaine.
o) Chromic Acid and Permanganate of Potassium.
p) Lugol's Solution and Solution of Potassa.
q) Syrup of Orange Peel and Tinct. of Chloride of Iron.

5. You are required to prepare 60 grains of Sodium Salicylate from Salicylic Acid. State how you would proceed and what precautions you would observe to prevent a discoloration of the salt.

$HC_7H_5O_3 = 137.67.$ $Na = 23.$

6. Your stock of ammonium Iodide has become discolored. State to what this is due and how you would remedy it.

7. Criticise the following prescriptions:

a) ℞ Pot. Iod.
Ferri et Quin. Cit. aaʒii
Syrupi ʒi
Aquae ʒiii
Misce.

b) ℞ Fld. Ext. Gelsem. ʒ iv
Fld. Ext. Cannabis Ind. ʒ i
Antipyrin ʒ i
Chloral ʒ iss
Aquae ℥ i
Dose ʒ i 3 x daily.

c) ℞ Bismuthi Subnit. ʒ ss
Mist. Cretae ℥ iss
Tr. Opii ʒ iv
Dose 1 teasponful.

d) ℞ Tinct. Iodi
Lin. Ammon. aa ℥ i
S. External use.

e) ℞ Hyd. Chlor. ʒ i
Syrupi ℥ i
Aquae Destill. ℥ i
M. Dose ʒi every 3 hours.

f) ℞ Syrupus Scillae ℥ i
Syrupus Senegae ℥ ss
Pot. Bicarb ʒ ii
Tr. Opii ʒ ii
Syrupi q. s. Adde ℥ iv
Misce. Dose ʒ ii

g) ℞ Aconitinae .03
Sacchari 4.—
Misce ft. pulv. vi
S. One every hour.

h) ℞ Acid. Hyd. Dil. ʒ ii

D. S. M. x t. i. d. in water.

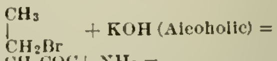
POST-GRADUATE CHEMISTRY.

1. Complete the following equations:

a) – $C_2H_5OH + PClS =$

b) –

$$\begin{array}{l} CH_2 \\ \| \\ CH_2 \end{array} + HCl =$$

c) –

$$\begin{array}{l} CH_3 \\ | \\ CH_2Br \end{array} + KOH\ (Alcoholic) =$$

d) – $CH_3COC + NH_3 =$

2. How would you ascertain the number of hydroxyl groups present in an organic compound?

3. Give equations illustrating the conversion of primary propyl alcohol into secondary iso-propyl alcohol.

4. Give equations (with graphic formulæ) illustrating the preparation of methyl-ethyl ether.

5. Enumerate the various physical and chemical tests which are usually applied in examining the fixed oils for the presence of adulterants.

6. Explain what is meant by a "ptomaine," also state the conditions necessary for the formation of toxic and non-toxic ptomaines.

7. Explain three different methods that may be employed in the alkaloidal assay of a drug, also state the advantages and disadvantages of each process.

8. Give the outlines of a method for the quantitative determination of arsenic in the contents of a stomach.

9. Give the outline of a process for the chemical examination of a sample of milk.

10. Give characteristic color tests for:
a) Atropine.
b) Strychnine.
c) Morphine.
d) Veratrine.
e) An opium preparation.

POST-GRADUATE PHYSIOLOGICAL CHEMISTRY.

1. State how the presence of sulphur may be demonstrated in the albumen molecule.

2. What compounds are formed as a result of the action of:
a) Amylopsin on Starch.
b) Trypsin on Albumin.

3. Name six precipitants for proteid bodies.

4. Name three color reactions for proteid bodies.

5. Give a method for the quantitative estimation of albumin.

6. What are derived albumins? State how they may be prepared.

7. Name the three classes of food stuffs, and briefly state their ultimate destiny in the body.

8. How does glucose differ from lævulose, physically and chemically?

9. Give three characteristic tests for glucose.

10. Describe a method for the quantitative estimation of glucose.

11. How would you prove that a certain stain consisted of blood?

12. How would you distinguish between oxyhæmoglobin and the hæmoglobin found in the blood of persons asphyxiated by illuminating gas?

13. What is the difference in composition of "blood serum" and "blood plasma?"

14. Name the changes that occur in normal urine on standing.

15. Name three conditions, pathological or otherwise, that have any influence on the density of urine as voided.

16. Show by equation how ammonium carbonate may be formed in an old sample of urine.

17. If nitric acid is added to urine and a precipitate is formed, to what would you attribute the phenomena?

18. Give a method for the quantitative estimation of urea.

19. Name three unorganized deposits that may occur in urine, and state how you would recognize them.

20. Name three organized deposits that may occur in urine, and state how you would identify these.

FOR DISTINGUISHING BENZOLE (BENZENE) FROM BENZINE (PETROLEUM ETHER). Gawalowski recommends the employment of picric acid; the former readily dissolves this reagent with an intense yellow color, while the latter solvent (benzine) is scarcely affected. If benzine is poured into a solution of picric acid in benzole the salt is precipitated in form of a crystalline mass.

THE PHARMACEUTICAL ERA

[*WEEKLY.*]

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Our subscribers do not need to be reminded of the desirability of preserving their copies and keeping their files of The Era complete. We reserve of each issue a limited number of copies to supply orders from subscribers who have neglected to keep their files complete. Our supply of these back numbers is becoming rapidly depleted, and old subscribers are particularly requested to let us know soon of any back numbers which they may require for completing their files. With each successive year the value of a complete file of Eras is sure to be enhanced.

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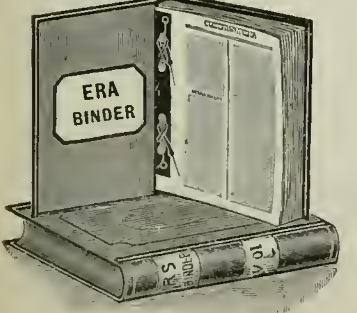

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Where the Cutters' Profits Lie.

People sometimes wonder how it is possible for cutters to sell certain articles at the prices they do and not lose money. All sorts of explanations have been advanced, such as purchasing in quantity lots and saving the discounts, or charging any loss up to the advertising account, and so on. And, too, it has been asserted that the cutter dilutes his alcohol as near to the burning point test as he can safely go, that his water of ammonia is "not as strong as we used to get," that the witch hazel hasn't the same satisfactory odor that we are accustomed to. On the "little drops of water, little grains of sand" principle this will undoubtedly account for some of the profits of a "less than cost" business. But another dodge has been discovered. A cutter in St. Louis is accused of selling by apothecaries' weight candy which he purchases on the 16 ounces to the pound basis. A pretty fair profit in the difference between the troy and avoirdupois pounds! This ingenious individual finds himself in trouble with the City Inspector of Weights and Measures who, misguided man, cannot be moved by specious argument from his position that in his department a pound must weigh 16 ounces of 437½ grains each; troy weight is not recognized as an equivalent substitute.

Wouldn't the public be angry if it knew of these petty swindles practiced occasionally, mind, we say occasionally, by some cut-rate concerns? Some good missionary work might be done by advising the public to invest in a hydrometer and a pair of scales and test its liquid and solid purchases from cheap stores. The public doesn't want cheap drugs, even at cheap prices, if it knows it, and it does hate to be swindled.

Danger in the Cup.

The soda fountain has always been accused of having a peculiar susceptibility to winks. But it is now credited with worse than this. The W. C. T. U., out in Chicago, says it gives the wink response when it is not requested to, in other words, that under various fanciful and apparently innocent appellations it dispenses pernicious drinks calculated to "lower young womanhood" from the fact that they contain alcohol, and hence create and foster a taste for liquor. There are, it is true, numerous concoctions dispensed at the soda fountain which contain alcohol, but the good ladies who are so insistent upon the reform are not entirely logical and consistent in their reasoning. Some of the very beverages they find harmless contain "adder tongue" in as great proportion as the worst of the concoctions they condemn. One of them in answer to the question, "Do they put liquor in the old drinks, or have they new ones?" said, "It must be the new ones, because I bought a glass of sarsaparilla to-day, and it tasted just as it always has." Is she aware that her favorite sarsaparilla contains as much alcohol as the hated "creme de menthe" soda, and that she has been unconsciously "lowering her womanhood" by her long time indulgence in it? We are strongly opposed to the soda fountain bar; we deprecate as strenuously as does the W. C. T. U. any action of the druggist which will debase mankind by catering to the drink habit, but we are inclined to think that in applying their strictures to the soda traffic in general the ladies are going a little too far and making a mountain out of a mole hill. The quantity of alcohol in soda syrups is very small as a rule; if it reaches the point where beverages may justly be styled alcoholic and open to censure on this score, then the druggist should be and is made to take out a regular saloon license to carry on the traffic. This license would kill his business with respectable people, and his fountain be patronized by those only who want liquor. The ordinary fountains are perfectly innocent, and the Chicago scare is of little consequence. Internal revenue and excise restrictions will take care of those who may attempt to overstep the bounds of law and safety. The young schoolgirl can still be allowed to indulge in her favorite ice cream sodas without danger to her morals. If she forms a habit for something stronger, it is not the fault of the fountain, but rather of her training. If she takes liquor, it is because she wants it, and is not ignorant of its nature.

The Worm Will Turn.

It is a trifle difficult, though, to tell which is the worm in this case. Druggists think the soda water business belongs to them, not to confectioners, in whose line it would logically seem to fall. At any rate, druggists invade the cigar, stationery, candy and a lot of other businesses in quest of profitable side lines, but they talk fight and "retaliation" if the candy merchant sells soda water and ginger ale. There is a case of this character attracting attention in Pittsburg just at present, and the druggists are taking advantage of an inconsistent blue law of long standing which really puts the confectioner in the position of the worm. Because of competition between druggists and candy men in that city, ice cream soda, etc., has been kept at the five-cent figure. But there's a law which permits druggists, but no other merchants, to do business on Sundays. And the druggists are going to do business on that day, and they propose to do a soda business, and they will charge ten cents on that day only. We cannot avoid thinking this a very petty sort of reprisal method, and we cannot entertain much respect for a law which makes it possible. Some Sunday observance laws are much like all sumptuary laws; they foster more abuses and evils than they do good. Either shut up all business (save such as involves necessity or mercy), or give all an equal chance at it. Half way measures of this nature are abominable.

Effort to Stop Prescription Refilling and Counter Prescribing.

The Nashville (Tenn.) Academy of Medicine has adopted and sent to every druggist in the city the following resolution:

> "Resolved, That the members of this academy will hereafter refuse to patronize, and will, so far as they can, prevent their friends from patronizing, all druggists whom they know to be accustomed to prescribe for sickness or disease, or who will refill a prescription for any one without the order of the physician originally writing or prescribing same.
>
> "That every druggist who indorses and is willing to comply with the above be requested to send his name to the secretary for report to the academy.
>
> "That druggists furnishing members with prescription pads be requested to have printed on same, 'Not to be refilled without the order of the writer.' "

This naturally has stirred up a lot of discussion, and the local papers are allowing the disputants columns of space to air their grievances. Literally and strictly construed, the resolution is perhaps a trifle too radical, but in intent it seems all right, if we may assume that this intent is solely to remove the prescription repeating and counter prescribing evils which constitute a legitimate cause for complaint on the part of physicians. It is to be regretted that newspaper publicity has been given to the affair, for the result desired cannot be reached in this way. Ill considered, one sided and prejudiced argument is allowed to befog the real question at issue. Druggists and doctors are now mounted in hot discussion of a recriminative character, illy calculated to settle the matter satisfactorily, certainly not in accordance with the wording of the resolution. The Academy of Medicine represents but a minority of the physicians, and the druggists who are taking up the cudgels do not voice the real opinions of the body of their fellow pharmacists. The resolution and the discussion it has engendered present only the worst side of the picture, making the condition of affairs look far worse than it is.

It would be far better for the doctors and druggists to get together, discuss the matter fairly and calmly, state their grievances one against the other, particularly the ones here singled out, and endeavor to arrive at an amicable and satisfactory understanding. This endeavor to force the druggists by threat of boycott into a particular line of conduct is certainly ill-advised. Arbitrate it, gentlemen.

The Care of Liquefied Gases and Explosives.

There have come into use during recent years a number of substances which have long been known to pharmacists and chemists, and to the general public, in their gaseous forms only, but now are supplied in liquid condition, thereby economizing space, expense, and adding to their efficiency. We refer to such articles as liquefied carbonic acid gas, oxygen, nitrous oxide, etc. There is no question of the increased efficiency and convenience of these articles when in the liquid form. For instance, a small cylinder of liquid carbon dioxide will supply gas sufficient for a large amount of carbonated beverage, or other carbonating purposes. But with all this has been introduced a very decided element of danger which must not be overlooked in the handling of these compounds. In reducing to the liquefied condition great pressure and reduction of temperature are employed, and the liquid article must be stored in tremendously strong containers. Upon release from this pressure the liquid assumes a gaseous shape, of course, occupying its gaseous volume, many times that of its liquid bulk. It is, perhaps, impossible to wholly guard against accident, but it is the part of wisdom to throw around the handling of these goods every safeguard possible. We believe the manufacturers, as a rule, do this of their own accord. But further than this, druggists and the public should fully appreciate the care which should be observed in the handling of these articles. The exposure of a cylinder of compressed gas to the heat of the sun, or subjecting it to violent agitation, is sufficient to sometimes cause explosion of the container, which, being of great strength and solidity, causes great damage when explosion brings about its disruption.

Besides the liquefied gases there are other substances which must be handled with care and not confided to ignorant hands. For instance, acetylene has come into considerable attention of late. This gas is produced from the solid carbide of calcium, and the presence of moisture is sufficient to dissociate the carbide, producing the acetylene gas, which under certain conditions is an intensely inflammable and explosive liquid. So in shipping or storing carbide of calcium every precaution should be observed to prevent the presence of moisture.

Some metallic substances, such as metallic sodium, articles like phosphorus, etc., for safety's sake are kept under water or other liquid, for exposure to air and light causes their rapid combustion. Cargoes containing these articles are held as extra risks by insurance companies.

It is gratifying to know that however careful the manufacturers of these dangerous compounds desire to be and are, it is ruled by law that certain precautions must be observed by them, and severe penalties imposed for non-observance of these regulations. In England these restrictions are definitely set forth, and, though without definite knowledge, we believe something of the same character is in force in the United States.

These remarks and this reminder are simple to call to the attention of the druggist, now that the hot weather with its accompaniment of the soda fountain is at hand, how essential it is that he should see that his cylinders of carbonic acid are preserved under the proper conditions, and that all inflammables and explosives are handled with caution, in due recognition of the responsibility which rests upon him.

AN EPOCH FOR ERA READERS.

THE ERA COURSE IN PHARMACY.

Announcement.

The management of the Pharmaceutical Era has great pleasure in announcing that its special plan for supplying its readers with a complete course in the study of pharmacy, which it has had in contemplation for a long time, is being brought to a successful issue, and will soon be in full operation. The plan, in brief, is to furnish to Era readers, especially the drug clerks and boys who are just beginning their drug career, a select course of lectures by eminent pharmaceutical educators upon the several subjects commonly included in the curriculum of the colleges of pharmacy, the course to be so arranged and conducted as to afford a graded, systematic and comprehensive course of study in the theory and practice of pharmacy.

The execution of the plan will be in charge of Professor J. H. Beal, who will be assisted by a corps of teachers of large experience, qualified by long acquaintance with the necessities and difficulties of students, and will be carried out in strict accordance with modern educational methods.

The objects of the undertaking are: (1) to furnish a thorough preparatory course of study for those who are expecting to enter upon a college course in pharmacy; (2) to supply a valuable auxiliary for students already engaged in college work, and (3) to afford a comprehensive and economical system of home study for drug clerks who may be unable to attend college. The course of study will, moreover, be projected along such lines as to make it of practical value to advanced students as well as beginners, as a review for experienced pharmacists and graduates from pharmaceutical schools, and of importance to all who are connected with pharmacy in any capacity.

As an addition to the lectures which will present systematically the fundamental principles of pharmacy, chemistry and materia medica, there will be presented a series of papers upon topics of every-day importance in the drug store, which will be prepared by practical druggists of long experience. The regular work of the curriculum will cover a period of two years, to be known respectively as junior and senior. Both years will include two series of lectures of twenty weeks' length each, exclusive of the papers upon special topics by the special contributors.

As an encouragement to the earnest and systematic study of the lectures, a system of quizzes and written recitations will be conducted by competent quiz masters, while as a further stimulus to students to put forth their best endeavors a liberal list of prizes will be offered for those who exhibit the greatest proficiency in their work.

The lectures and series of papers will be printed in the regular weekly editions of the Era, and the quizzes and examinations will be conducted by mail direct with each student. The only additional expense to Era subscribers who wish to join these classes will be a purely nominal fee to cover the expense of examination blanks, postage, etc.

A general prospectus, containing a full outline of the various courses of study, and giving many other important details, is now in course of preparation, and will be furnished to all applicants. THE PUBLISHERS.

OPPORTUNITY.

In his address to the graduating class of the New York College of Pharmacy, April 29, Hon. Lemuel E. Quigg spoke as follows:

"Mr. President, Ladies and Gentlemen: I wish it were possible to convey to these young ladies and gentlemen an adequate idea of how happy they ought to be in view of the fact that they have reached a point where it matters neither to them nor to anybody else how much they know or do not know. But this cheerful state of mind is possible for the present moment only. It has never been theirs before, and never will be again, for their next step will carry them into the shadow of responsibility. It is gratifying to think that they have acquired an education which will be of real service to them, and a sort of knowledge which they can put into immediate and practical use. Not all of what we call education is of this character. We load our boys at college with tasks for which too often they have neither present liking nor subsequent use, and our girls at boarding school with affectations that friends are expected to call accomplishments. When the boys go out into the world to do for themselves and the girls get married to be done for, they both look back and wonder why they were obliged to learn so many things that are not so, and so many other things that are not important.

But these graduates have been occupying their time to good advantage, and we can well believe that they are equipped with substantial resources for mastering the problem of life. It is a delightful problem. It fascinates while it perplexes. It never tires a gallant mind nor dismays a gallant heart. It is all that makes human life superior to any other form of life. In no other respects are our achievements superior to those of a jack rabbit save in solving the question how to know a chance when we see one, and how to make the most of it when we get it in our hands.

You young ladies and gentlemen are not seeking an ambitious calling measured by the space in the daily newspapers which your achievements will probably fill; neither is it your intention to follow that utterly, and I might say meanly, selfish pursuit to which so many young men now seem to be committed, in which the sum of their own gains is measured by the sum of other men's losses. But reputation or a good income awaits your efforts, and I am sure the work for which you have been preparing presents opportunities whether it appeals to the commercial or scientific instinct, entirely comparable to those to be found in any other. For a banker, for a broker, for a politician, for a lawyer, their possibilities in life are easily defined. But for the chemist, the incalculable good which can be conferred on mankind by what his eye can discern and his genius can evoke ennobles and justifies his profession. There is no achievement of civilization with which the labors of Pasteur do not favorably compare. That single illustration teaches that talent is very unimportant and industry futile if you cannot make use of opportunity. How ample your opportunities human wants declare; how present, all experience teaches.

I am not sure it is in any man's tongue to tell where opportunity comes and how it may be improved. It cometh and goeth very much as it listeth, but it does come, all the time, to everybody. It is as indifferent to the fitness of things as a woman at whist to the rules of the game. (Laughter.) It is as generous to the dull and unworthy as to the intelligent and deserving; but in any event, to every man and every woman comes a daily tribute of opportunity, which, with every move he makes and with every glance he gives, consciously or unconsciously, he is accepting or rejecting. We can congratulate ourselves that the power to see and improve opportunities is an American characteristic. As a new race in a new land it had to be so, and the power to overcome obstacles, to make things come our way and go our way, whether they want to or not, is characteristic of the American people (applause), and behind it, as our supreme expectation is our American birthright—a fair field and no favor. No man can take it from the least of us. No man can have more of it than the least of us. It is a right which entitles us to aim where we please, at what we please, with no other license, no other hindrance than our own. It is worth having, that American birthright, and if any fact has been demonstrated by the long list of American successes, it is that no single star in the deep blue sky of infinite opportunity is too high or too bright to come within the just aspiration of every American citizen. (Applause.)

There is not much that I can say to you, young ladies and gentlemen, that will add to your knowledge of drugs, but I don't think it is as much special as it is general knowledge that enables us to get along in the world. I call that fact to the especial attention of the fourteen honor men. The thing that does enable men to succeed is a knowledge of human nature mostly. And if there is to be any advantage to you from my remarks this evening it will be because I have succeeded in impressing upon your minds the thought that you are going to live and work among your fellow citizens, and that the thing for you to find out is human nature and how to make it useful. We live in a practical world, not looking far ahead or behind. It is not too fond of information. It is suspicious of prophesy and impatient of retrospect. It likes the kind of man that can turn to and do things while it waits. It has no use for the man that dreams. It judges his work by its results. He must do something, and something it wants done. And so I warn you, young ladies and gentlemen, you must go along with the procession. You must not go too slow, or you will be left behind; nor too fast, or you will be pulled back and punished for your presumption. It makes no difference how clever, how industrious and how ambitious you are, you must not waste your time on problems the world does not want solved. Men won't take what you give simply because you offer to give it. You must give what they want, and here is the chief lesson of life.

There is a certain democratical instinct which it is necessary to possess in order to make a full use of opportunities. It is that instinct which enables a man, no matter what his station, to get along on an absolute equality with everybody else, no matter what their position may be. If you cannot make circumstances both flattering to those with whom you come in contact and creditable to yourselves, you engage in the competition of life at a very serious disadvantage. You should create the impression that all men are equal, and when they are not so, every man likes to think they are, so at least as to you and to him. The man who hopes to make the most of his opportunities if he is really going to realize them has got to be controlled by a desire to accomplish something for other people. He must remember that right and wrong, when you get away from the ten commandments, cease to be positive quantities. He must remember that nobody is truly good or hopelessly bad. All, good or bad, have a place in the universe. It is the height of intelligence to be able to put yourselves in other men's places. The most dangerous man in the community is he who never learns, never forgets and is always consistent. (Laughter and applause.)

It is the art of the opportunist to take things as he finds them without being too insistent on the correctness of his own conclusions, for if he thinks a moment he will realize that his judgments have been compelled by observing things with his organs of vision from his point of view, and that precisely the same facts viewed by other organs of sight from other points would result in different conclusions and different lines of action.

Ambition, young gentlemen, has no time for rest. It never sleeps. It pauses only to survey its further course, and it understands that the only observation worth taking is that from the top of the hill. It clutches at the root of the tree; it runs around the treacherous rock. No man can see beyond his present horizon unless he goes on and on. No such thing as content is worth while. If a contented man exists he's poor stuff. He belongs in the Orient, where they worship repose. There is no place in this country for him. There is too much here to be done.

Gentlemen, there is a high philosophy to teach that for a man to seek his own happiness at the expense of the happiness of others contributes as little to his happiness as to his self respect. Neither should we encourage that vulgar estimate of men that cannot see values in character and intelligence, and to which the question "What is he worth?" suggests only stocks and bonds and real estate. And there is a culture to be pursued having for its object that the achievements of our people in art and industry may tend to the improvement of the race, to the advancement of civilization, and particularly to the amelioration of the conditions that surround the very poor. Above all else, or nearly all, we want a patriotism that will keep bad men under and leave the race to power and distinction open to those who mean well, a patriotism that will exalt the souls of men so that when they step into a polling place and express the purposes toward which their souls are drawn, they will vote for home and country. There is also a socialism to be engendered—you may call it a religion—that every heart should be responsive to the gentle mandate, "Bear ye one another's burdens," not from an oppressive sense of duty either; not from vulgar vanity; not to answer accusing memories; not to deaden conscience—there is many an endowment that had its origin in a plundered trust—but because, "Whatsoever ye would that men should do to you, do ye even so to them."

Golden winged, priceless opportunity,
Borne on the wing of chance,
Lighted with the flame of promise,
Always out-holding its sealed offering.
Spring, boy, quick! It is the home you covet
After all these barefoot days upon the street.
Reach out, young man; it is your dream of fortune—
The counting house, the marble mansion, the country seat,
And acres stretching far.
Cry low, little woman; it is the love
Your gentle soul has sighed for.
Strike! man, strike!
It is empire and a throne. (Applause.)

MICRO-ORGANISMS.

*Their Effect and Influence in Certain Chemical Industries, More Particularly in the Manufacture of Leather, Wine and Beer.**

By GUSTAF SCHACK-SOMMER, Ph. D.

Micro-organisms may be divided into three classes; bacteria, yeasts, and moulds, all of which play a more or less important part in pathology, as well as in many chemical industries. The aim, therefore, of the manufacturer in whose industry these organisms take part, should be directed towards promoting the increase of the beneficent and destruction of the harmful.

One of the subjects I originally intended to include in this paper was brought before this society by Dr. Voelcker, in London, in November last. I refer to the inoculation of soil with organisms found in nodules on roots of leguminous plants, whereby the assimilation and utilization of the free nitrogen of the atmosphere by the growing plant are promoted. I therefore omit the subject of artificial manuring through the aid of micro-organisms, and pass at once to the consideration of the first-named industry at the head of my paper, namely, tanning. The importance of the leather industry may be gathered from the fact that it is now said to rank fourth among English industries. In the process of tanning, the hides are first soaked for weeks in lime pits, so as to loosen the hair and the fleshy matter which adhere to the skin, and to transform the hide into gelatin, with which tannic acid combines to form tannate of gelatine, or leather. As some skins, such as that of the calf, turn black in the tan pit should all the particles of lime not have been previously removed, and since for some purposes the pores, which the lime bath has caused to shrink and close, need opening, the skins or hides, which have been previously swelled by the liming process, require to be brought into a condition which allows of the easy and thorough removal of the lime and lime soap. To obtain a uniform shrinking of the swelled hides, the skins go from the lime pits into dog or pigeon-dung baths. The process consists in treating the hides for some time (sometimes four or five hours) in a vat containing a lye formed of solutions of dog, pigeon, or poultry dung. In some cases the dog dung acts best, and pigeon or poultry dung in other cases, but no satisfactory and sound explanation has as yet been given as to the precise kind of action which occurs.

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*Read before the Liverpool Section of the Society of Chemical Industry, March 3. Reprinted from the Journal of the Society.

In 1896 Dr. Popp and Dr. Becker, of Frankfort-on-Main, were granted a patent for a process which resulted from the discovery that the action of these lyes is the result of bacteriological processes, and not, as has been very generally assumed, of the action of phosphoric acid. They examined dog, poultry and pigeon dung bacteriologically, and showed in the first instance that even after removal of all other constituents which, according to existing views, entered into reaction, the result was the same. Continued research disclosed a second result, viz., that a number of micro-organisms exert considerable influence on the lye, partly beneficial and partly detrimental. They say that, generally speaking, the non-peptonizing bacteria act beneficially, while the peptonizing ones generally have a detrimental effect. The specification states that in connection with this discovery, two methods of utilizing them have presented themselves. (Jour. Soc. Chem. Ind., 1896.)

In the December and January numbers (1896, 910, and 1897, 52) of the Jour. Soc. Chem. Ind., there have appeared articles entitled "Fermentation Phenomena in Tan Liquors," by F. Andreasch, to which I beg to call your attention.

In the preparation of tobacco the presence of the right kind of micro-organism has been found to greatly enhance the value of the finished product; it has, therefore, been found advantageous to sprinkle the leaves at the commencement of manipulation with the liquid, which contains pure cultured micro-organisms of the required kind, and the result has been much more satisfactory than if the fermentation had been left to chance.

Although pure cultures have, to the best of my knowledge, not been employed in the manufacture of white lead, the so-called Dutch process is based on the action of bacteria contained in the dung by which the lead plates are surrounded.

Quite a number of chemical compounds, which it has been quite impossible hitherto to produce synthetically, have been brought about by the help of micro-organisms. As an instance, I have only to name lactic acid. Dr. Alfred Koelliker, proprietor of the firm of Dr. L. Marquart, at Beuel, near Bonn, has made use of pure cultivations in manufacturing pharmaceutical preparations. I understand that he ferments sugar solutions at 104° F. (40° C.) with a pure cultivation lactic ferment. The lactic acid, while being formed, is neutralized by adding lime or chalk during the fermentation. This calcium lactate is purified by frequent re-crystallization, and is then either sold as such or used for making lactic acid or ferrous lactate. Colors for eatables are now prepared with pure cultures of bacteria on rice, a process which the Chinese have known for ages.

In the preparation of a liquid glue for photography, photo-lithography, etc., gelatin or other nitrogenous substances are peptonized with bacteria, such as Bacillus prodigiosus.

Thus far the action of the micro-organisms has been considered as the cause of chemical action, but we now come to other industries where they are not only promoters of chemical action, but are of the greatest importance in producing flavors in those substances in which they are allowed to multiply. Take for instance the manufacture of cheese and butter. It is generally known that in butter-making, pure culture bacteria (bacteria of the species producing the desired flavor, and not bacteria which produce unpleasant flavor) are used for inoculating the cream for the purpose of making good butter. The bacteria favorable to this purpose are already in the market, two or three different kinds now being used in this country, the result being that the butter-maker can depend with more certainty upon the product.

For the manufacture of cheese the proper selection of bacteria is of still greater importance than in the case of butter. The curd itself is practically tasteless; it is set to ripen, and it is during the process of fermentation (ripening), which is brought about by micro-organisms, that the taste develops. The different kinds of cheese are mainly due to the growth of different kinds of bacteria in the cheese. Theory in this latter industry is, however, yet ahead of the practice, and much good work can still be done in this direction.

The most important industries in which fermentation plays a part are brewing and distilling, and the manufacture of wine. In the first and second fermentation is started artificially by adding yeast, whereas in the third the grape juice ferments without any such addition. Brewers have learnt from experience that with the same raw material they may get products with different flavors, and they have known for a long time that it is advantageous for them to get now and again a fresh supply of yeast from breweries where an avowedly well-flavored beer is produced. In the same way experience has taught distillers that the yield of alcohol from the same raw material may vary several per cent. The wine manufacturer, too, found that in certain years his must would not ferment, although by chemical analysis its composition did not suffer from that of former years, and so he attributed the failure to the difference in the ferments.

Pasteur, Hansen, Joergensen and others have shown that these differences are due to the quality and variety of the species of yeast used. They have arranged methods by which the yeast varieties may be distinguished, and by which the most suitable can be picked out. As a consequence certain establishments have adopted the pure cultivation and rearing of special varieties in their works, and the largest and most scientifically and intelligently conducted breweries work now with these pure culture yeasts with the very best results. They find that if they are uniformly careful in the selection of their raw material and in the manner in which they conduct the fermentation, the use of pure culture yeast enables them to have a regular and uniform product of a characteristic similarity of taste. In distilling the same experience has been gained. Preference is now given to those yeast varieties which give an especially high yield of alcohol, and pure cultures are made accordingly. The conditions here, as in brewing, are specially advantageous, as the mash is boiled, and so sterilized, before the addition of the yeast.

Must cannot stand sterilizing as it would spoil its flavor, but it is all the better for pasteurizing, that is, heating for half an hour in an enamelled or tinned vessel at a temperature of from 130° to 149° F. (60° to

65° C.) and then cooling down to 68° to 72° F. (20° to 22° C.) To that must which does not contain sufficient nitrogen for the nourishment of the yeast, some should be added. For instance, it is nearly always deficient in cider, perry, and must made of berries, such as elderberry, currant, or gooseberry; to these 15 to 20 grams of chemically pure chloride of ammonium should be added to every 1,000 to 1,200 litres of must.

Germany has taken the lead in adopting the discoveries of Pasteur, Hansen, and Joergensen in wine manufacture. Messrs. Popp and Becker, to whom I am indebted for much valuable information embodied in this paper, and a great many yeast specimens, have the best known institute for the pure cultivation of yeast in Germany. In France, Messrs. Schloesing Freres & Co., Marseilles, are working on similar lines. The former state, and prove their assertion by many examples, that the quality of the wine that has been fermented with pure yeast culture is not only improved, but that the influence on the character of the wine is most telling. The discoveries which were first made in the laboratory, that some varieties of yeast produce more alcohol and glycerine than others, that they have a great influence on the taste, flavor and bouquet of the wine, and that by the addition to the must of pure culture yeast the fermentation is more rapidly accomplished than if left only to the influence of its natural ferments, have been confirmed on a large scale.

As there are many kinds of fruits and cereals, each of which has its proper name, such as cherry, plum, apple, wheat and barley, so there are a similar number of varieties of yeast, which will cause a fermentation in sugar-containing solutions like must and maltwort. The products of these fermentations, however, differ much from one another. While some produce alcohol and carbonic acid gas, others produce nauseous compounds. Yet even the fermentations of those varieties which produce principally alcohol differ very much both in the energy and speed with which they start fermentation and in the time they require to accomplish their task, and in the extent to which they can decompose the sugar. While some start growing and evolve carbonic acid gas early and stop after several days when the yeast settles at the bottom and leaves the liquid comparatively clear, other varieties start slowly with very little escape of carbonic acid gas, dragging on the fermentation for months, and preventing the liquid from becoming clear. All these varieties of yeast, the good as well as the bad, are generated in and on the soil, and scatter their spores through the wind on to the grapes, from which they get into the must. If the beneficent kinds predominate, the wine ferments energetically and quickly, and is soon clear, but if the others are in the majority, or even numerous, no matter from what cause, then the must will ferment badly and slowly, and will not show signs of becoming bright after months have elapsed.

By using a properly selected pure culture yeast, peculiar to the same kind of grape or one of another particular species, the resulting wine will be of a better quality than if the must had been left to chance fermentation. It would be a mistake to assume that it would be possible to make from any grape juice the choicest wines, for although the influence of pure culture yeast on fermentation is very great, the slower or quicker development of the fermentation and the composition of the finished wine is among others dependent on the quality of the must.

Pure culture yeast has been applied with great advantage in cider and perry manufacture, with the result that these lose their peculiar rough taste and become more winelike. A still more favorable result has been obtained with wines made from berries, especially in the speedier finishing of the product. A wine made from bilberries frequently takes three or four years before it is ready for drinking. This entails a great loss in interest and no small risk. With a suitable pure culture yeast the fermentation will take place much more quickly and much better. Currant and gooseberry wine, which must contain a high percentage of alcohol, should only be fermented with pure culture yeast specially adapted for a thorough fermentation.

The fact is thus established that it is not the geographical position alone and the soil on which the vine grows that account for the characteristics of a wine; but that just as great importance should be attached to the kind of yeast used, for not only does the yeast decompose the sugar in solution and so form alcohol and carbonic acid gas, but it assists as well in the decomposition of malic acid and in the formation of succinic acid, glycerine, and various aromatic compounds, to which the flavor of the resulting product is due.

Having arrived at these conclusions, it naturally followed that the chemist went a step further, and tried the effect of the yeast of the choicest wines on other raw products, such as beerwort. Besides the scientific value of these experiments, they promised, if successful, a new field of industry, namely, the manufacture of beverages similar to wine in countries where the grape does not grow; beverages, too, while containing a larger percentage of nourishing properties, rival in flavor and excellence many of the best known wines of Southern climes.

Pasteur was the first to try the fermentation of beerwort with wine yeast. The result as far as the aroma went was satisfactory, but was very disappointing as regards flavor. M. Jacquemin, of Paris, and Dr. Sauer, of Schoeneberg, near Berlin, picked up the threads where they were dropped by Pasteur, and went to work in the eighties to investigate the same problem. Jacquemin took out a patent in England in 1887 for a process he discovered, but which I understand has never been exploited. (Jour. Soc. Chem. Ind., 1888).

I find in Jacquemin's specification, that he added a suitable quantity of bitartrate of potash to the wort, with the object of producing an acidity similar to that of the grape, and thereby obviated the necessity for introducing lactic ferment, one which brewers have great difficulty in avoiding, and which he said was detrimental He then introduced the elliptical ferment of wine yeast. But the above-mentioned addition of bitartrate of potash was not the only addition of a chemical; he introduced tartaric acid into the cane sugar solution for the purpose of inverting it, and this solution after having been boiled was then added to the wort to accelerate the fermentation and produce a higher percentage of alcohol. He contends that the said inversion of the sugar by an organic acid is essential, as otherwise the fermentation would be too slow to give good results. What Jacquemin said of lactic acid in 1887 was quite right then, for impure lactic acid retards a good and pure alcoholic fermentation, and I suppose the addition of the various chemicals had a good deal to do with the fact that Jacquemin's "Vin d'Orge" has never become a popular beverage.

Dr. Sauer some five years ago applied for a patent for a process embodying the results of his discoveries. He succeeded in solving the problem of producing a wine in every way equal in character, flavor, and aroma to similar wines made from must, and, moreover, succeeded in freeing this product from all malt taste or smell. He discarded the yeast of the vines of his native country and of those of France, and made pure cultivations from yeasts that have a greater power of fermentation, probably arising from the fact that they are gathered from grapes of southern climes which contain a much higher percentage of sugar. Where, however, he had the greatest advantage over Jacquemin was, that in the meantime the process of producing pure lactic acid by the pure culture lactic acid ferment had been discovered, and it had been ascertained that pure lactic acid had a favorable influence on alcoholic fermentation while checking the growth of other micro-organisms.

Probably on that account Dr. Sauer was enabled to experiment on the pure malt decoction, generally called wort, without adding any chemicals whatever and only introduced pure cane sugar into the liquid, as required for raising the alcoholic strength. In his process of fermentation, which I shall describe more fully presently, he produced beverages containing 18.5 volumes per cent. of alcohol.

Dr. Sauer chooses his malt according to the character of wine he wishes to represent and prepares his wort in the copper in the same way as it is done in every brewery. The malt-wort used in brewing beer is as a rule somewhat acid, yet seldom reaches more than 0.1 per cent., and even that quantity is undesirable in the manufacture of beer. In the case of making Dr. Sauer's malt-wine the desired effect is brought about by adding a pure culture of lactic acid ferment. This is allowed to act on the malt-wort heated up to 122° F. (50° C.) for twenty-four hours, in which time it will have changed 0.6 per cent. to 1 per cent. of the wort and produced the lactic acid required. It is then pasteurized, that is, heated quickly to 167° (75° C.), and so the lactic acid ferment is destroyed. At this point it is necessary to cool the hot wort down to the proper temperature, that is, 77° F. (25° C.), and then add a purely raised wine yeast, to induce fermentation. These yeasts are peculiar wine yeasts (sacch. ellipsoideus), which are specially selected. They are raised from a small quantity, if possible only one cell, on sterilized, acidfied malt-wort. The selection of these wine yeasts should be made in accordance with the particular kind of malt-wine it is desired to produce; in other words, in choosing the yeast one must be guided by the flavor and aroma required.

During the fermentation the embryo wine tastes somewhat like "must." The fermentation is accelerated and intensified by the gradual addition of raw sugar, and when this is completed, the preparation must be so treated as to eliminate from it everything that can suggest to the taste or the smell its malt origin. This is done by the action of the oxygen of the air.

The difference between low fermented liquors which contain under 12-13 volumes per cent. of alcohol (under which head are included all beers, and by far the greater number of the grape wines of Central Europe), and the high fermented alcoholic beverages which contain over 12-13 volumes per cent. of alcohol is that the latter will mature if they are judiciously exposed to the air, whereas the former spoil if the air is not carefully excluded.

The malt wine is kept for some weeks in contact with constantly renewed outer air, at a temperature of 122° F. (50° C.) or over. The higher temperature not only hastens the maturing process, but, at the same time nullifies the baneful influence of micro-organisms in conjunction with the acidity and alcohol present in these beverages. While beer is invariably shut off from all contact with the atmosphere, at a very low temperature, and matured entirely by after-fermentation, malt-wine is, on the other hand, matured as above stated, after its fermentation is completed.

A peculiar odor arises from the aromatic properties of the malt, and the alcoholic contents, the exact composition of which has not yet been determined. Whether this odor, which is also present in the very best old selected Tokay, is acetal, as discovered by Von Liebig, must be left to future investigation. Certain it is, however, that the malt aroma disappears entirely, and is replaced by a very agreeable one.

After the precipitate of albumen has settled, the liquid is put into casks and left to ripen. After this the malt-wine is ready to be bottled and will keep for any length of time.

The wine, to begin with, is akin to beer, with which its mode of manufacture is practically identical. Its ingredients are also of such a nature as to allow of malt-wine being classed for excise purposes among the beers. It differs from them in the relative proportions of the ingredients, and especially in containing a large proportion of alcohol, in which property it compares with the high fermented genuine wines. It also differs from the known beers in appearance and taste, in both of which it resembles the proper grape product, justifying the assumption that it may take the place of genuine grape wine, although the chemical composition is not the same.

The tests for salicylic, tartaric, citric, and malic acids gave negative results. The acids present may, therefore, be assumed to result from fermentation, and consist of lactic and succinic acids. Analyses indicate that these preparations are beverages of a sweet-wine character, and, with respect to the amount of alcohol and sugar they contain, are absolutely identical with sweet wines. They are distinguishable from the latter in containing a not inconsiderable quantity of dextrin, and of extractives peculiar to malt, whereas the extractives of the genuine grape sweet-wines are absent. With regard to their nutritive qualities, they are on a par with extract of malt beers, but their stimulating powers are fully equal to those of sweet wine.

Owing to the presence of the nourishing extractives of malt (which include nitrogenous substances, dextrin as well as phosphates), they should replace the so-called medicinal wines now in use. One of the advantages claimed for these wines is that they are free from sulphates, which are present in sherry and similar southern wines, owing to these having been clarified with gypsum.

(Special Correspondence)

FROM THE FRENCH CAPITAL.

Paris, April 20, 1897.

President Faure at a Chemistry Lecture.

Professor Jungfleisch, of the Paris School of Pharmacy, has for some seven years past given evening lectures on Applied Chemistry at the "Arts and Metiers" School. His pupils are mostly young fellows employed in the chemical and other factories outside the city walls. "Many of them," says the professor, "have worked until 7 p. m. in the factories of Puteaux, St. Denis, or Aubervilliers, and then come to my class, arriving home about midnight. Their desire to gain knowledge is most praiseworthy."

It was to these hard-working students that M. Felix Faure paid the latest of those informal visits which he delights to make to deserving institutions. He arrived about 9.30 p. m., on March 31, accompanied by a few officials, at the school, and passed into the amphitheater, where about 200 auditors were following M. Jungfleish's lecture on the nature and properties of charcoal, coal and gas. President Faure having replied to the students' cheers by a polite salute, quietly took his seat and gave a good example of close attention to the remainder of the discourse. On terminating, Professor Jungfleish bowed to the President, and M. Faure in his turn led off a hearty round of cheers for the professor, and (after sundry compliments to the school officials) left the building.

M. Jungfleisch, now 57 years of age, was in his younger days an "interne" in a Paris hospital pharmacy. He was the pupil, and subsequently the collaborator of the famous Berthelot; the well-known "Treatise on Organic Chemistry," which they jointly produced in 1881, has run through several editions. When Berthelot left the School of Pharmacy in 1876, M. Jungfleisch succeeded to the chair of Organic Chemistry. Winner of the "Jecker" prize at the Academy of Sciences in 1872, and member of the Academy of Medicine since 1880, M. Jungfleisch has presided over the Paris Society of Chemistry (1879), as well as the Society of Pharmacy (1883), and is one of those savants in whom the Paris School of Pharmacy takes a just pride. His works are numerous. I may just cite his "Chemistry Manipulations" (1886); his monograph on Gutta Percha Production (1892); and his recent studies on cinchonine in collaboration with M. Leger.

The Prevention of Blindness

formed the subject of a lecture at the Quinze Vingts (ophthalmic) Hospital. Dr. Kalt's treatment of purulent ophthalmia by permanganate of potash was stated to be particularly successful. It is certainly cheap enough—a kilo of permanganate costing forty cents suffices to prepare 3,000 liters of eye wash. Five liters, heated to 25° Centigrade, are used for each application; a child's sight may often be preserved by four or five such washings, we were informed.

Hope For the Bald.

Dr. Sabouraud, of the St. Louis Hospital, Paris, professes to have discovered the microbe of baldness. He showed the Society of Dermatology a rabbit which had lost half its fur after liberal inoculation with this "seborrhic" bacillus.

But the disappointing part about the doctor's paper was the announcement that the remedy was yet to be discovered.

The Cures of Potts' Disease.

effected by Dr. Calot, of Berck, are of course surgical, and not pharmaceutical, but are remarkable enough to deserve passing comment. He chloroforms the hunchback child, lays it on its stomach, presses the spine into its place, and maintains the form by a plaster case enveloping the whole body. He presented several children to the Academy of Medicine who had been thus successfully treated.

A Medical Scandal.

Less to the credit of the doctors is the famous Boisleux-La Jarrige case, which has terminated in the condemnation of two surgeons to five years' "reclusion" for reckless gynecological operations. It was a sad affair all through, and I will not imitate the Parisian journalists who daily indulged the public with revolting details. That ovariotomy is strongly criticised here on account of the dwindling population, and that the numerous class of women who are too poor to pay a Dr. Pean and too proud to enter a hospital are treated with more oecnomy than prudence in certain "cliniques" are the two strongest impressions left on my mind by innumerable newspaper "leaders," and by the evidence at the trial.

Doctors Criticised on the Stage.

One of the latest successes at the Comédie Francaise, Brieux's "L'Evasion," is a scathing criticism on doctors. It is clever, if slightly exaggerated, and my own medical man, while pooh-poohing the writer's arguments, admitted as much, and added, "The theater was full of doctors the night I saw it."

The author makes saving clauses in favor of Pasteur and Roux, I noticed.

Belgium Honors French Pharmacists.

M. Planchon, director of the Paris School of Pharmacy, has been elected honorary member of the Belgium Academy of Medicine, and Professor Riche a corresponding member. Another new honorary member is M. Arloing, of the Lyons Veterinary College, whose notice on

The Toxicity of Waltzing

created some amusement lately. He macerated the flannel undervest of an indefatigable "dancing man" (after a soirée) in distilled water. A dog inoculated with the liquid died; the lesions resembled those produced by diphtheric toxine.

The Endowment of Study and Research

is, remarked M. Moissan, unfortunately rare in France. So Solvay & Co.'s donation of $20,000 to the Nancy Chemical Institute has attracted more attention here than it would have done in America, England, or Germany. The "Temps" newspaper points the moral that it really pays big manufacturing houses to help science in this manner.

No one who has traveled from Nancy to the frontier of German Lorraine can fail to notice how many factories have sprung up around that pretty town since the annexation of Metz and Strasbourg—chemical works like Solvay's; glass factories, and iron foundries. It is pleasing to notice that the growing wealth of Nancy is put to a good purpose. Several smaller contributions have since been announced, and all will be devoted to the building and equipment of new laboratories at this institute, which was opened by Carnot in 1892.

The Students' Carnival Procession

at Mid-Lent was as amusing as ever. On one car nine or ten young fellows were got up in imitation of well-known Professors—Dr. Brouardel, M. Brunetiere (now in America), and Prof. Milne Edwards (who teaches zoology at the Paris School of Pharmacy)—among others were represented. Some of these masqueraders made short speeches to the crowd in accordance with the characters they assumed, while their robes of office rendered them irresistibly comic. They were presided over by "The University of Paris," a good-looking young female in suitable attire.

The "Car of the Plague" was a dismal, hearse-like affair, and rather shocked than amused the crowd, although the "Little Black Pigs" (medical students) who surrounded it were supposed to be armed with syringes of Yersin's serum.

As to "Hippo Krott" (the wondrous horse "inoculated by skillfully concocted serums against all known and unknown diseases"), his cortége included one or two "Rabelasian" features, whose broad humor induced equally broad smiles from the dense and merry crowd along the "Boul. Mich." and the wild war dance around King Carnival's bonfire closed what is one of the most amusing features of our yearly life in Paris.

Obituary.

Dr. de Bossy, eldest of French doctors, died at Havre, aged 103. His hope "to live as long as his father" (who died aged 108, it is stated,) was thus disappointed. He was born in Paris during the height of the Reign of Terror, three months after Louis XVI.'s execution.

M. Paul Lair, drug clerk and latterly traveler for a wholesale pharmacy house, poisoned himself with cyanide; he had been run over, and complained of internal injuries.

Looking Forward.

Next week will probably see some stirring discussions of the cut-rate patents question. On Thursday the General Association of French Pharmacists meet at Paris, and the following day Monsieur Collard, the indomitable enemy of the proprietary medicine, will hold the Congress, which he invites every French pharmacist to attend.

But even if he can persuade the meeting that the "Syndicate of Manufacturers of Pharmaceutical Products" are only negotiating to gain time, I fancy that too many pharmacists put up specialties of their own to vote the total suppression of this line.

Possibly, as last year, the dissension may prevent any unanimous decision being arrived at; all I trust is that if the new Pharmacy Bill comes on, it may find the pharmacists as a body ready to act up to the good old motto:

"In things essential, Unity;
In things doubtful, Liberty;
In all things Charity."

For I am convinced that they have opponents numerous and powerful enough to make dissensions in their ranks undesirable, if not fatal to their interests.

*ACETIC ACID AS A MENSTRUUM AND SOLVENT.**

By JOSEPH P. REMINGTON.

Any one who has delved, even moderately, into the pharmacy of the ancients must have noticed the frequency with which the vinegar of that time was used as a solvent, but the nineteenth century has witnessed the gradual decline of the use of acetic acid in pharmacy.

The alcohol question, which is so perplexing, and which is still unsettled, furnishes a reason for diverting the attention of the pharmacist to some liquid which will, occasionally, take its place. The object of the following experiments is to determine whether acetic acid cannot be made to replace alcohol in at least some of the preparations now in common use.

The antiseptic power of acetic acid is frequently overlooked, and there is no question that the vinegars, if properly made, could advantageously replace many tinctures. Slightly acidulated liquids are palatable to most patients, and these, when combined in prescriptions with syrups, are particularly acceptable, inasmuch as the acid counteracts the cloying sweetness of the syrups. Then again, it is very desirable for physicians to have alternative preparations of the same drug to give to patients who are liable to become victims of the alcohol habit, and it cannot be denied that the prescribing of tinctures, elixirs and other alcoholic preparations has been the innocent means of working disaster.

The writer, four years ago, made a number of fluid extracts, using acetic acid in place of alcohol. These have been allowed to stand alongside of others which have been made with alcohol and most of them have proved their superiority. It is the intention to report upon these later.

It will at once occur to the reader that the presence of strong acetic acid in a fluid extract would be objectionable on account of its taste; but it can be shown that it is possible to evaporate the fluid extract at a very low temperature, thus getting rid of the acetic acid, and then redissolving a proper portion of the extract in a solvent. If this extract be standardized, a definite preparation is secured. It is true that a portion of the extractive seems to be rendered insoluble during the evaporation; but the experiments will show that this can be redissolved by varying the menstruum, and, in addition, it can be shown that this insoluble extractive usually represents inert substances.

In a number of experiments instituted an extract of nux vomica was prepared with a 10 per cent. acetic acid, made by E. R. Squibb & Sons, and proved by assay to contain 15 per cent. of alkaloids. These acetic extracts can be made dry and pulverulent, and to distinguish them the writer proposes for them the name of "Acetracts."

The object of forty experiments (given in detail by the writer) was to ascertain whether acetic acid can advantageously replace alcohol in the extraction of a drug like nux vomica. The answer is decidedly in the affirmative. Acetic acid may be used for exhausting a drug known to be difficult to exhaust, like nux vomica.

A solid preparation can be made from it; this can be assayed and standardized, and the liquid preparations made by redissolving the solid in various mixtures of alcohol and water, with or without glycerin, and of different strengths of acetic acid.

If the proper menstruum be chosen, the residue will be inert, and may be filtered out. A number of other drugs have been exhausted with varying strengths of acetic acid, such as sanguinaria, kola, ipecac, squill, cinchona and colchicum seed.

A number of samples are presented, and especial attention is called to sanguinaria with acetic acid 60 per cent. This fluid extract has been made four years, and does not show the least sign of precipitation. It, doubtless, would be just as satisfactory if made with U. S. P. acetic acid, and experiments are being conducted now which will prove this view.

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*American Journal of Pharmacy.—Abstract. W. Dr.

THE PHYSICIAN FROM THE DRUGGIST'S STANDPOINT.

By JAMES A. ROBINSON, M. D., Pawtucket, R. I.*

When asked by our president to write a paper on this subject for your discussion, I must confess that I hesitated, being as I am the only registered physician who is also the only registered pharmacist, and knowing the strong tie of brotherhood which ought to exist between the physician and the druggist, but which tie has been gradually drawn down to a minute thread and threatens every day to break and make them sworn enemies. I hesitated, I say, for fear that the vials of wrath which have been bottled up by thirty or forty physicians for future use when some poor, lone pharmacist should fall into their power, might be poured out upon me, and while I am willing to suffer for the sins of omission and commission of my own, I did not feel able to bear those of the whole pharmaceutical profession.

Nevertheless, I have undertaken the task and will endeavor to outline the relations between the two professions, for such I consider them both, and such they are considered by the laws of the State, as the fact that both have to register to practice indicates.

This estrangement between the two professions we might liken to a disease, since it is a disordered state on both sides. It is not acute and of recent date, but chronic, and the causes which, small at first, might have been removed by a calm deliberation between the two professions and a little more firmness on the part of the physician, have increased on account of the retaliation on the part of each until we are in our present condition, and what remedy is to cure the malady is yet to be discovered.

We are in very much the same condition as a couple of small boys who have had a misunderstanding and resort to blows to settle the argument. A hits B because B hit him, B hits back and so the thing goes on till neither of them is in a condition for reconciliation, when, if they had stopped to consider the matter calmly in the beginning, they would have saved all this bad blood.

Among the causes of this feeling between the two professions are:

I. The general desire to get things cheap.

II. The use of patent medicines.

III. The absence of laws regulating the number of physicians and pharmacists.

IV. The use and abuse of the prescription.

I. Whether it is on account of small wages or on account of the desire to spend money on outward display and personal gratification, the fact remains that people are trying to spend as little money as possible upon their physical complaints.

While the average man will spend five dollars on a pleasure excursion, or the same on his lawyer to get square with his neighbor for some fancied wrong, the fact that he has got to pay his physician two dollars for a visit almost takes away his breath and makes him seek some cheaper means of recovery, and in the end he loses becauses he lays out more on this and that remedy than the physician's services would come to.

But there is no subject of which people are so ignorant and yet think they know so much as that of the cure of their physical complaints.

Every one has his little recipe handed down through successive hands with an assurance of efficacy which would appall the intelligent physician and would make the veriest quack hesitate.

With this idea of superior knowledge in his head the person seeks a place to get his remedy and where can he go but to the drug store where it is compounded, not at prescription prices, because he knows the names of the ingredients and their retail price, but at the lowest price he can obtain after a comparison of prices gained from several stores. In other words, it is simply a bid to furnish the remedy as cheaply as possible for fear that the druggist across the way will outbid you and thus get the man's trade.

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*Read before the Pawtucket (R. I.) Medical Association. Reprinted from Atlantic Med. Weekly.

Many of these are physician's prescription where the physician from hurry, a desire to pose as one whose medicine can be got cheaply, or from a desire to get rid of a poor-paying patient, has written the simple English of the drug, leaving the druggist nothing to do but to furnish the drugs at the market price.

While it may not be the case, the druggist is given the impression that the physician coincides with the patient in the idea that the price of the prescription is exorbitant and that he is aiding the patient to get his medicine cheap, and at the same time making his own fee more easily obtainable than if he had given a prescription to be paid for at the usual rates.

After purchasing his remedies and finding that they relieve him, he soon begins to ask concerning the action of drugs, how much to take, etc., till finally he spreads out his complaints to the druggist, when he thinks they are not severe enough to consult the physician.

The druggist, knowing he has a living to make and fearing that if he refuses his customer will go to some other druggist or invest in some patent sold at cost, prescribes for the person and thus keeps his customer. This is repeated many times till finally the druggist (who, by the way, is considered a bureau of information in his locality) becomes his family adviser as far as minor complaints are concerned.

If he is taken severely ill then his case goes to the physician.

I have said that many of these came from physicians. Now if the doctor writes his order for drugs in plain English, his income is cut into more than he is aware of, because when the patient knows the name of the drug he buys it just as he buys any merchandise, and when once obtained he can get it again when he thinks he needs it without consulting the physician as to whether he really needs it or not.

An instance came under my observation some time ago which illustrates this and shows how many people try to save money, and at the same time it gives the physician the idea that the druggist is treating him unfairly and exposing the nature of the contents of his prescriptions.

A girl came into my store having in her hand a narrow strip of linen paper, on which was written carbolic acid, simply this and nothing more, with the request that I give her one ounce of it.

Now carbolic acid is sold a great deal at my store for use in house cleaning, for bed bugs and other vermin, so I put her up an ounce of it labelling it poison.

When I asked her what it was to be used for she said she did not know, and when I sent her home to find out, she came back with another strip of paper on which was written, "use as directed for an injection" with the doctor's signature.

The whole trick is plain to you all.

The person who sent the girl knew that the prescription called for carbolic acid, that the common price was ten cents per ounce, while on a one-ounce prescription she would have to pay a quarter. So if she could call for the article without showing the prescription she could save ten or fifteen cents.

She then cuts out the first strip of paper and sends it along by the girl so she would not forget what she was going after.

The stuff was, of course, put up and labelled poison. The deed was done, so that when the second slip was brought there was nothing to do but to tell her to use it as the doctor told her to.

Of course, the doctor on his next visit saw his prescription exposed and probably thinks to this day that I treated him unfairly when I was beaten by the tactics of a shrewd woman.

If this prescription had been written phenol, the thing never would have happened.

I have spoken of the physician's telling the patient what to get and how much to take, etc. To my mind this is a bad plan both for the physician and the pharmacist. An oral prescription never has the weight that a written one does, and the medicine which can be bought for ten or fifteen cents has not the power it would have if it was put up as a prescription costing thirty-five or fifty cents.

In the former case it would not have the trial which it would in the latter case. The patient would expect less from it, knowing what it was, than he would if it was in a prescription. In the latter case he would be almost sure to take the whole contents, even down to draining the bottle, simply because it represented money expended and he would be unwilling to waste it.

Thus, the physician would get the full effects of the medicine, the patient would feel that his physician was doing him some good, simply, in many cases, because he was pinning his faith on his physician through the medium of the prescription, and one cause of this, that he was taking the medicine faithfully to get his money's worth. The pharmacist would be benefited by the fact that the physician's confidence in him would be strengthened by the good results obtained from his medicines.

The same rule applies to the cut rates in prescriptions. There is not the confidence in the cheap prescription, either on the part of the patient or physician, that there is in one put up at the usual rate, even though the ingredients may be the same, and, without that confidence, much of the efficacy of the prescription is lost.

II. The use of patent medicines.

The patent medicine of to-day is, and, in fact, for the past ten years has been, the bane of existence of the druggist as well as that of the physician.

The physician has seen it drive away dollar after dollar from his income, because the people, knowing as little as they do and thinking they know so much, look for some positive assurance as to the effects of the medicine, and look for a cure from one prescription.

Now, no intelligent physician, knowing the fickle nature of the action of drugs, can give any such positive assurance, but the patent medicine manufacturer (who imposes on the credulity of the patient) then steps in with just the preparation that is needed (in the patient's mind) with the positive assurance that this preparation will cure the disease and has never been known to fail. In fact, the only limit to the number of diseases that the medicine will cure is the size of the wrapper. If they had twice as much space for printing the number of curable diseases would be doubled.

The belief on the part of the patient is brought about by the circulation of pamphlets describing diseases in such a way that diseases we know are incurable are claimed with the most positive assurance to be curable by the use of their medicine, and they can back up their claims with a bushel or two of testimonials.

Here is a case in point.

Among their questions are:

1. Do you have pain and scalding on passing water?
2. Is there a reddish sediment in the vessel on cooling?
3. Is there a frequent desire to pass urine and a little at a time?
4. Is there pain in the back? and others which every physician knows indicate gravel, a condition which is comparatively easy to cure.

Now this quack tells the patient that he has Bright's disease, but their remedy is a sure cure for these symptoms. He takes the remedy, is cured of his gravel and comes out with a testimonial of having been cured of Bright's disease, which he never had.

By this one we may know them all; while they may be all right for minor complaints and probably do have some virtue, as a rule they do more harm than good, but until the people can be taught that medicine is not a positive science, just so long will they continue to flourish and be sold.

As false as are the claims of these makers and as much as their methods are decried by physicians, there are many of the latter who are guilty of the same methods.

There are some who see in every affection of the lung, pneumonia; in every trouble in the throat, diphtheria; in every fever, typhoid; when at heart they know that not one-half of them are affected with these diseases. They do it to increase their reputation as skillful physicians and get credit for curing diseases which never existed. They are not honest toward their patient or toward their fellow-physician and are just as guilty of deceit as these patent medicine makers whose claims are so impossible.

In many cases these patents have been prescribed by physicians, the makers have taken advantage of the fact in their advertisement and placed the medical profession in a poor light with the people—viz., using in their prescriptions what they are crying down to the world.

As the people demanded them, and as there was good money in them, they were sold by the druggist just as any article of merchandise, and no conscientious druggist could recommend them because he did not know what was in them. But when the prices were cut to rock bottom, as they are to-day, and he found the cutter was using them as a bait to draw trade and then sell them his own goods, the other druggists began to get out preparations of their own.

They had to do this because they saw the profits on patents fast going to nothing, and had to turn to some source to replace their vanishing profit with a fair one.

In this the druggist is not harming the physician any more than the original patent did. In the majority of cases he could produce a better article than the advertised one, one which he could recommend because he knew what was in it, and whose sale would be in direct proportion to the confidence of the people in him.

It is a conflict between the druggist and proprietary manufacturer and does not harm the physician unless he may have used one of the physician's prescriptions as the formula for his preparation. This, of course, is a breach of confidence on the part of the druggist and no druggist guilty of this offense ought ever to enjoy the confidence of that physician.

The majority of the druggists do not do this, as their aim is to produce something original, and, like all men who have their little hobbies, their formula is to their minds better than that of the physician or any one else, and they wish to make the preparation distinctly their own.

This the druggist has a perfect right to do and nobody can gainsay it, for he is supposed by the examining board to know not only the nature of drugs, but their doses, etc., and is capable of compounding preparations for minor complaints in the same empirical manner in which the physician prescribes.

In regard to the preparation of drugs the pharmacist is more familiar than the physician, and, while the physician may prescribe more accurately, the druggist is the better compounder, and many times his knowledge has saved the physician from many serious mistakes. This he does not herald to the physician or others, but if the mistake is the other way the druggist usually hears from it, and others, too.

The general idea among physicians is that the drug business is inferior to theirs, that any physician has the necessary knowledge to conduct the business successfully without the aid of a registered pharmacist, and many think they ought to get registered on the strength of their medical knowledge.

If any think thus let them try it.

The writer had this same idea before he engaged in the drug business, never having been behind the counter to learn the ins and outs, and his first experience was as proprietor after seven years of country practice, where he was compelled to acquire considerable insight into prescription work. The rest of it he had to pick up as best he could.

I was examined by the Massachuetts board in 1889, was fortunate enough to pass the first time. I was told that my examination was very good for a doctor, at which I took offense on account of the seeming disparagement of the profession and remarked that any doctor was fitted to run a drug store.

This caused great merriment on the part of the examiners, and I was told that out of fifty applicants, since the establishment of the board in 1886, only three had passed. In other words, only 6 per cent. of the physicians knew enough about drugs to be granted a right to dispense them.

The conditions being thus, the druggist contends that if the doctor cannot pass the examination he is not a fit man to dispense, and when he begins to presume upon his superior knowledge in this direction, the druggist thinks he has just as much right to prescribe and does so. Now both are practicing that for which they never were educated, for the amount of pharmacy taught a physician at college is almost nil, and the druggist gets about as much therapeutics.

They both continue on in this way because neither of them is willing to acknowledge that the other knows more about his own business than he does.

This cause of bad feeling will probably exist as long as the two professions, the doctor dispensing to protect himself and the druggist prescribing to protect himself as he thinks.

Both are on the wrong track. The office of the physician is to diagnose and prescribe, and there his work should end. In a busy physician's life there is little time to devote, even if he has the ability and facilities, to preparing his own prescriptions, and this time could be better spent in reading and original research, to which he is adapted, than to dabble in that for which he is not fitted and which yields him a poor return for the time spent.

If the physician would precede his lecture course with a year's experience in a drug store he would be well started in the art of dispensing which practice would perfect. A better knowledge of chemistry would free his prescriptions from many imperfections, and would make him less dependent upon tablet triturates and ready-made preparations. The large number of packages of different preparations, two-thirds full and seldom prescribed, ever remind the druggist of this lack of ability on the part of the physician. With a better knowledge, the physician would be able to construct his prescription from raw material, which would give him a preparation distinctly his own, and would redound to his credit and reputation as a physician. This would also help the druggist's income and secure his co-operation in the perfecting of the doctors' preparations.

III. The absence of laws regulating the number of physicians and druggists.

That there are too many physicians and druggists no one can deny. Many are attracted to the medical profession by the seeming prosperity of those engaged in it, and find too late that it is overcrowded; much of the business is done for no remuneration whatever because physicians are proverbially poor business men, do not collect their bills in a business way, and do not dare to demand their just dues, but let their bills run on to be settled when the debtor pleases.

This cutting of their income calls for an increased amount of work, so that there is a sharp competition among physicians to increase their practice.

Seeing this condition of affairs, and thinking that if he can furnish the medicine for his patient he will increase his income by not compelling him to go to the drug store for his prescription, he does so. If he does not furnish it he tells them what to get, thinking that by lessening their expense he is strengthening his hold upon them; but this very endeavor to assist his patient in this way acts like a boomerang on him, fitting the patient to doctor himself, for the next time he needs any medicine for what he thinks are the same symptoms, he goes to the druggist and buys it, and thus the doctor loses him. Where this is done every day by the majority of physicians you can readily see the amount of money they throw away. If they would protect themselves more and not try so hard to get patients from their fellow-practitioners that they surrender their only hold on the patient, they would have less cause for complaint of the druggist.

The druggist also suffers from overcrowding just as much as the physician, and must enter into the keen business competition which is characteristic of the age, and when he sees the physician apparently depriving him of his prescription profit, and taking the drug business into his own hands it is not to be wondered at that he should retaliate and do a little prescribing.

If proper laws existed limiting the number of physicians and druggists, each would get more remuneration from his own distinctive business, and there would be more co-operation on the part of each.

(To be Continued.)

PHARMACY.

Merck's Annual Report for 1896 has, as usual, collected much valuable information regarding various old and new remedies, especially such of the latter as have achieved considerable prominence. A few abstracts from this report follow:

APIOLINUM is a yellowish fluid obtained by saponification and distillation from extract of apiolum viride, the crude ethereal oil of parsley fruit. Apiolin has a neutral reaction; it is soluble in alcohol and boils between 280° and 300° C. Its specific gravity is 1.135. French writers claim for apiolin that it acts upon the circulation by stimulating and producing a congested state of the blood vessels, and, at the same time, affecting the contractility of the striated muscular fibers of the uterus. In France it is used in the treatment of morbid suppression of the menses as a means of inducing regular menstruation. Owing to its pungent smell and taste it is advisable to prescribe apiolin in gelatine capsules.

AMYLUM IODATUM INSOLUBILE is an extremely hygroscopic powder, of a blue-black color, having a sweetish taste and emitting a smell of iodine. It is absolutely insoluble in water. Iodine starch has hitherto only been used for internal iodine treatment, but recently C. Majewski (Wien. Med. Presse, 1896, No. 19.) has pointed out its utility as a powerful antiseptic for wounds, R. Trzebicky (Przeglad Lekarski, 1895, No. 44, and Therap. Wochenschr, 1895, No. 49) having previously used amylum iodatum for the same purpose with success. This preparation appears to be a good substitute for iodoform in the treatment of neglected and suppurating wounds, of cellulitis, venereal and carious ulcers, whitlow and galled feet. It possesses several important advantages as compared with iodoform, being decidedly more active and absorptive, non-irritant, odorless, non-toxic and considerably cheaper. Iodine starch is not adapted for those dressings which cannot be changed frequently, since the decomposed product develops an unpleasant pungent smell, which is absent from iodoform dressings. Amylum iodatum gauze is prepared in the following manner: One part of iodine starch is mixed with 4 parts of strong spirits of wine. One square meter (= about 1 1-5 square yards) of gauze is uniformly saturated with 75 grams (2½ fl. oz.) of this mixture, and the fabric is then dried. The dry amylum iodatum dressing consists of 1 to 16 layers of the gauze and a sterilized wood wool pad.

AURUM METALLICUM GRANULATUM, for Jolles's method is a yellow, coarse grained powder serving for the qualitative and quantitative detection of mercury in urine by the extremely simple and sensitive method devised by Jolles (Wien. Med. Presse, 1895, No. 43). This method is based in principle upon the fact that coarsely granulated gold possesses the greatest amalgamating power of all metals. Consequently, if the mercurial compound contained in the urine be decomposed by stannous chloride assisted by warming and stirring, the precipitated mercury combines in the nascent state with the gold lying at the bottom of the vessel. Owing to the high specific gravity of the gold the clear liquid can readily be decanted, whereupon the amalgam may be cleansed in a few minutes. To this clean amalgam a few drops of hot concentrated nitric acid are added, whereby the mercury is dissolved. This solution is diluted with a few drops of distilled water. It is then cooled and placed in a test tube. The capacity of the entire fluid is then about 1 to 1½ ccm. (16 to 24 m.) If an equal bulk of saturated freshly prepared stannous chloride solution be added the slightest presence of mercury is at once indicated by a distinctly perceptible clouding of the fluid. This method is so extremely sensitive that 0.0002 gram (1-300th gr.) of urine is still detected with unfailing certainty. It is not restricted to the wet process, but is also available for dry tests made in the following manner. The amalgam obtained in the way explained is washed with water, followed successively by alcohol and ether, and is then placed in a combustion tube about 10 cm. (4 inches) long and 1 cm. (0.4 inches) in diameter. The amalgam is now placed in a drying oven and kept therein at about 40° C. for say five minutes, whereupon it is brought to a red heat, which causes the slightest presence of mercury to be indicated by a deposit of mercury on the sides of the tube. This manner of carrying out the method is also well adapted for quantitative analysis. It is for this purpose only necessary to completely expel the mercury from the tube and to determine the decrement. This decrement represents the actual amount of mercury originally contained in the liquid.

EXTRACT OF LEECHES is an aqueous sterilized extract of the heads of Sanguisuga medicinalis hardened in alcohol, dried and pulverized. Two ccm. (½ f. dram) of this extract contain the active components of one leech. The buccal secretion of the leech has been shown by Haycraft (Landois, Lehrbuch der Physiologie des Menschen, 7th ed., page 54,) to have the power of preventing the coagulation of blood, and more recently Dickinson (Journ. of Physiology, 1891; Repertoire de Pharmacie, 1892, page 129,) and Landois-Schultze (Therap. Monatsh., 1892, page 140,) have proved that an aqueous extract of leeches' heads possesses the same properties. This extract retards coagulation of blood, not only in vitro, but also in corpore vivo. This has led Landois to suggest the addition of leech extract to blood required for transfusion in order to obviate defibrination of the blood. As has been shown later on by Sahli (Atti di XI., Congresso Medico Internatzionale, Vol. III., Medicina Interna, page 15,) this anti-coagulative property and the harmlessness of intravenous injection of leech extract furnish probably means of effectively treating recurring thrombosis and infarct. Experiments of this kinds necessitate, however, in the case of adults, the use of some 150 to 200 cm. (5 to 7 fl. ounces) of extract. Recently Rose and Delesenne (Comptes Rend. de l'Acad. des Sciences de Paris, 1896, II., page 465 and 500,) have made the interesting discovery that blood rendered non-coagulative by the addition of leech extract resists putrefaction for a considerable time both in vitro and in corpore vivo, keeping in maximo as long as a month without decomposing. This property cannot possibly be ascribed to any antiseptic action on the part of the extract, since it is in itself an excellent medium for the cultivation of many forms of Schizomycetes. It must therefore be assumed that the extract produces changes in the blood. These changes may indeed be demonstrated in the microscope, which shows the leucocytes in a condition of higher vitality, mobility and voraciousness than is the case in normal blood. These changes not only strengthen the leucocytes in their struggle against the pathogenic microbes, but it is also possible to produce real immunity and even absolute protection from experimental infection.

CALCIUM CARBIDE.—Guinard (Bull. General de Therap., 1896, of May 15.) was the first to demonstrate the utility of this substance for medicinal purposes. He employed calcium carbide in the treatment of cancer of the vagina and cervix uteri by introducing pieces of this substance of the size of nuts into the vagina, thus placing them in immediate contact with the growth. The vagina was then plugged with iodoform gauze so as to keep the liberated acetylene gas, which is formed together with caustic lime, in constant contact with the growth. After about four days the plugs were removed and the vagina was rinsed with a 0.1 per cent sublimate solution. It cannot be pretended that calcium carbide is a remedy for cancer, yet it is capable of reducing the graver symptoms of this malady, viz., the hæmorrhage, fœtid discharge and the attending pains; the growths dry and fall off and leave an even and smooth surface. The haemostatic action is due to the acetylene gas, the caustic effects being produced by the resulting calcium oxide, which is, however, soon converted, by the vaginal moisture, into a harmless hydrate. G. Livet (These de Paris, 1896, and Rev. Internat. de Med. et Chir., 1896, No. 18, page 347,) having continued the experiments of Guinard, suggests that the calcium carbide treatment should not be limited to uterine cancer, but proposes its extension to other maladies accompanied by obstinate hæmorrhages, pains, and fœtid secretions, as is the case with certain fibromas and various forms of metritis. The only real disadvantage which this treatment involves is its painful nature, the introduction of the calcium carbide being shortly after followed by a more or less acute burning sensation, which sometimes continues for a few hours. Calcium carbide should always be dispensed in bottles fitted with air-tight stoppers so as to obviate its decomposition through access of moist air.

CELLOIDINE is a very highly concentrated collodium which is obtained by distilling off the ether-alcohol from ordinary collodium. It is sold in translucent, highly opalescent tablets, which are soluble in a mixture of alcohol and ether. Celloidine was hitherto used exclusively as an embedding medium in histological investigations. Recently it has been employed as a means of hermetically covering wounds, advantage being taken of its property of forming upon dry skin a very firmly adhering and impervious film. A suitable solution of celloidine may be prepared by dissolving one part of celloidine in four equal parts of absolute alcohol and purest sulphuric ether. R. T. Williamson (Brit. Med. Journal, 1896, No. 1,842.) and James Mackenzie (Ibid., No. 1,831,) recommend it as a general substitute for collodium, and point out the advantages of its much greater reliability and superior adaptability, toughness and durability. The use of celloidine is particularly to be recommended in minor operations, since it renders further dressing unnecessary.

LECITHINE, Distearinic-glycero-phosphoric-choline-ether.—

$$C_3H_5 \left\{ \begin{array}{l} O.\ CO.\ C_{17}H_{35}. \\ O.\ CO.\ C_{17}H_{35}. \\ O.\ PO.\ (OH).\ OC_2H_4N(CH_3)_3OH. \end{array} \right.$$

This is a white or yellowish, wax-like mass, which is soluble in alcohol, ether and chloroform. It swells and gelatinizes in water and salt solutions, but it does not actually dissolve therein. Lecithine, the most important phosphorus constituent of nerve tissue (brain mass, etc.), is also largely present in vegetable tissue. It is commonly prepared from the germs of oats, yolk of eggs and other bodies, which contain this substance in fairly large quantities. From recent investigations it would seem that lecithine is an extremely interesting body from a biological point of view, and that its clinical application is a question of the near future. A year ago J. Stocklasa (Sitz.-Ber. der k. k. Akademie der Wissenschaften, Vienna, 1895, page 104, and Ber. der Deutsch. Chem. Gessellschaft, 1896, page 2,761.) pointed out that lecithine played an important part in the vital processes of the organism of plants, and B. Danilewski (Compt. Rend., 1895, Dec. 30, and Westnik Mediciny, 1896, No. 1,) observed at the same time that tadpoles fed with lecithine developed with extreme rapidity. Later on the same author showed (Comptes Rendus, July 20, 1896,) that the subcutaneous and internal introduction of lecithine in the system of young warm-blooded animals (dogs in this case) produced a powerful influence upon the growth of the body, and effected an improvement of the blood and increase of the brain mass as the result of the acceleration of the bioplastic morphogenous processes. It was in particular to be remarked that dogs treated with lecithine were much more active, mentally brighter and physically stronger than the control animals. Lecithine was applied either hypodermically or externally. In either case an emulsion in normal salt solutions was used. Of this a quantity containing 0.002 to 0.05 grams (⅓ to 1 gr.) of lecithine was injected under the skin or into the abdominal cavity. Double or triple this quantity was given internally. Danielewsky and Selensky (Fortschr. d. Med., 1896, No. 20,) experimenting on the blood forming properties of the spleen and the bone marrow, have concluded that lecithine has an active share in the hæmatopoetic processes taking place in these organs.

ERYTHROLI TETRANITRAS (Erythroli Nitras), $(CH_2.\ ONO_2)_2$, $(CH.\ ONO_2)_2$, is a product of nitration obtained from erythrite $C_4H_{10}O_4$, a tetratomic alcohol derivative of erythrin $C_{20}H_{22}O_{10}$, which is found in many lichens, particularly in those of the species Rocella. It forms large scales, which are insoluble in cold water but freely soluble in alcohol. It fuses at 61° C., and, like nitroglycerine, explodes if concussion or sudden heat be applied. According to the investigations of J. B. Bradbury (Brit. Med. Jour.), erythrole nitrate belongs to that group of teleangiestatic media of which amyl nitrite and nitroglycerine are already extensively used for clinical purposes. Erythrole nitrate, like nitroglycerine, is used in cases of angina pectoris, asthma, heart diseases, chronic inflammation of the kidneys, etc. Owing to its explosive nature, it should be dispensed with the utmost precaution. It is for this reason advisable to use English erythrole nitrate tablets, each of which contains 0.03 gram (½ gr.) of this substance, mixed with a little chocolate. One or two tablets represent a dose, which suffices in ordinary cases, but may, if required, be repeated after the lapse of 4 to 6 hours.

TOOTH WASH TABLETS:

Heliotropin	0.01 gm.
Saccharin	0.01 gm.
Salicylic acid	0.01 gm.
Menthol	1.00 gm.
Sugar of milk	5.00 gm.
Spirit of rose, sufficient.	

Make into 100 tablet triturates. The tablets may be colored red with eosine, green with chlorophyl, or blue with indigo-carmine.

——The Massachusetts Board of Registration in Pharmacy held meetings for examinations on April 20, 21 and 22 in its rooms in the State House. In all, 45 candidates were examined. Certificates were granted to the followlowing named: Edward L. Barrett, Lawrence; Frederic L. Breed, Fairhaven; John C. Keane, Milford; Roy D. Judd, Erwin P. Higgins, John L. McGown, Frank H. Knight, Boston.

QUESTION BOX

The object of this department is to furnish our subscribers with reliable and tried formulas and to discuss questions relating to practical pharmacy, prescription work, dispensing difficulties, etc. Requests for information are not acknowledged by mail and ANONYMOUS COMMUNICATIONS RECEIVE NO ATTENTION.

Unanswered Queries.

(R. T. V.) No Address.

(O. B.) Boise, Idaho.

(C. & B.) Morganfield, Ky.

See rules at the top of this column for the conduct of this department. Queries from anonymous correspondents receive no attention. Neither have others than subscribers and subscribers' clerks any claims upon it. To receive attention here clerks not subscribers must give their employers' names with their requests for information.

Formula Wanted.

(E. W. C.) Cooper's drops.

Registering Trademarks.

(L. D.) See this journal, March 11, 1897, page 303.

Ice Cream from Milk.

(W. A. H.) See formulas on page 513, last week's issue.

Oil of Ston..

(L. C. M.) "Oil of Stone" is an old name for crude petroleum.

Coloring Benzine with Tincture of Iodine.

George J. Durbin, Ph. G., Plymouth, Pa., reports that he has found tincture of iodine a satisfactory substance for coloring benzine. He says none of the ordinary aniline dyes produces the desired results.

"Oil Ansenni" What is It?

(W. C. T.) wants information regarding the identity of "oil ansenni" in the following prescription for a liniment. Who can give it?

Oil gaultheria,
Lin. saponis,
Chloroform,
Oil ansenni.

Equatorius Garciana.

(R. H. K.) "Equatorius Garciana" (this journal, April 16, page 488,) is not Garcinia Morella, natural order, Guttiferæ, growing in the equatorial regions, etc., as you remark, but it is undoubtedly intended for Equatoria garcinia, which Mr. W. S. Thompson, Washington, D. C., informs us is the botanical name given to condurango by its original exploiters in this country in the sixties. See this journal, April 30, 1896, page 552.

Violet Water.

(I. L. R. M.)

1.) Extract violet (from pomade)	2 fl. ounces
Extract cassia (from pomade)	6 fl. drams
Spirit of rose	6 fl. drams
Cologne spirit	1 pint
2.) Extract violet (from pomade)	8 fl. drams
Extract cassia (from pomade)	8 fl. drams
Spirit of rose	4 fl. drams
Tincture Florentine orris	4 fl. drams
Cologne spirit	1 pint

Dental Obtundent.

(J. R. K.) The preparation you name is a proprietary one, and we know nothing of its composition. In 1893 Prof. S. P. Sadtler, of Philadelphia analyzed a number of proprietary dental anæsthetics (this journal, Oct. 1, 1893, page 298), all of which, with one exception, he found to contain 0.20 to 5.68 per cent. of anhydrous cocaine hydrochlorate. All but two of the preparations examined he reported to contain carbolic acid.

Aqua Vitæ; Hematis.

(E. J. H.) F. Frentz, pharmacist at 311 Seventh avenue, this city, says that "hematis" occurring in the prescription submitted by you (this journal, last issue, page 513,) is natural oxide of iron, of a reddish brown or blood red color, and it is found in the trade in long, square pieces and in powder. It is used in the arts and in veterinary practice, the French name being "hématite" and the German "blutstein."

Perfumed Witch Hazel.

(J. H. W.) The following may be used as a face lotion by barbers:

(1) Spirit of lavender	1 ounce
Rose water	6 ounces
Distilled extract witch hazel, enough to make	16 ounces
(2) Glycerine	3 ounces
Orange flower water	5 ounces
Distilled extract witch hazel, enough to make	16 ounces

Of course, the perfume may be altered to suit the taste.

Elixir of Hypophosphites with Quinine and Strychnine Hypophosphites.

(R. J. S.) Try the following:

Quinine, alkaloid	16 grains
Strychnine, alkaloid	½ grain
Dilute hypophosphorous acid, N. F.	15 minims
Elixir hypophosphites, N. F., enough to make	16 fl. ounces

Dissolve the alkaloids in the dilute hypophosphorous acid with a little water, and add the elixir of hypophosphites. One fluid dram of this elixir contains ⅛ grain quinine hypophosphite, 1-256th grain strychnine, hypophosphite, about 3 grains of calcium hypophosphite, and 1 grain each of sodium and potassium hypophosphite.

Teaspoonfuls and Teaspoonsful

(R. J. S.) writes: "Kindly state which of the two sentences are (?) correct—two teaspoonfuls every four hours, or two teaspoonsful every four hours." Our correspondent seems to be floundering somewhat in the sea of grammatical construction, else he would hardly use a plural verb (are) in a sentence having a singular subject (which) any more than would he ask the plural of "teaspoonful." We would inform him, however, that the sentence, "two teaspoonfuls every four hours," is correct, "teaspoonfuls" being the plural of "teaspoonful." A teaspoonful is the quantity of any substance a teaspoon will hold. Two teaspoonfuls stand for a certain measured quantity and it does not necessarily indicate the number of teaspoons used in the measuring operation.

Compound Syrup of Phosphates.

(B. A. L.) A clear, transparent, amber-colored syrup cannot be dispensed from the following prescription:

Phosphoric acid	16 grains
Potassium phosphate	12 grains
Magnesium phosphate	8 grains
Calcium phosphate	6 grains
Iron phosphate	8 grains
Quinine hydrochlorate	2 grains
Strychnine	1/15 grain
Syrup, enough to make	1 ounce

The principal difficulty is that caused by the incompatibility of the iron salt with phosphoric acid. At best the formula is not a practical one. A satisfactory preparation of this character is the compound syrup of phosphates of the National Formulary, revised edition.

Tooth Wash.

(C. B. M.) Commenting upon your formula for tooth wash, this journal, April 22, page 482, John von Rohe, Winona, Minn., says if you will use 1½ ounces pure castile soap (costing about 26 to 28 cents per pound by the case), shave it fine, add it to boiling water, stir with a glass rod until a solid mass of foam is produced, then adding to the soap mixture the remaining ingredients you will have no trouble with the formation of a "hard gelatinous mass." Thus revised your formula will read:

Castile soap, fresh shavings	1½ ounces
Glycerine	4 ounces
Alcohol	6 ounces
Water	6 ounces
Oil peppermint	20 minims
Oil wintergreen	30 minims
Oil cloves	10 minims
Extract vanilla	½ ounce

Worm Syrup.

(G. M. R.) Try the following. We cannot give the formula for the proprietary article:

(1) Santonin	30 grains
Oil sassafras	4 minims
Alcohol	2½ ounces
Fluid extract pink root	2 ounces
Fluid extract dandelion	1 ounce
Fluid extract golden seal	½ ounce
Molasses, enough to make	6 ounces
(2) Fluid extract spigelia	5 ounces
Fluid extract senna	3 ounces
Oil anise	10 drops
Oil caraway	10 drops
Simple syrup	8 ounces

Dose, 1 or more teaspoonfuls at intervals until purging commences.

Some other formulas are given in this journal, Aug. 20, 1896, page 249.

Camphor Cream for Barbers' Use.

(J. H. W.)

(1) Gum tragacanth	1 dram
Glycerin	½ ounce
Camphor water, enough to make	8 ounces

Soak the gum tragacanth in four or six ounces of camphor water, which should be freshly prepared. Add the glycerin and enough camphor water to make the whole measure 8 fluid ounces.

(2) Quince seed	1 dram
Hot water	14 ounces
Borax	1 dram
Glycerine	2 ounces
Spirit of camphor	1 ounce
Oil of bitter almond	10 drops

Macerate the quince seed for several hours with the water; strain, add the glycerin, and in the mixture dissolve the borax. Dissolve the oil in the spirit of camphor and gradually add to it the mucilage and mix thoroughly.

Filtering Bay Rum.

(H.) We cannot understand what caused your preparation of bay rum to deposit a sediment upon standing and after filtration unless it is that you have used two little alcohol. Bay rum to "stand up" well and remain transparent should contain at least 50 per cent. of alcohol, although it is often made with a less amount. We suggest you make up your preparation, allow it to stand for eight or ten days, and then filter in a well covered funnel through magnesium carbonate, previously rubbed into a paste with a little alcohol.

A cheap article which has given satisfaction is this one:

Oil of bay	1½ drams
Oil of pimento	45 minims
Acetic ether	1½ drams
Alcohol	32 fl. ounces
Water	32 fl. ounces

Mix the oils and ether with the alcohol, add the water, allow to stand several days, and filter through magnesium carbonate.

Pharmacists and the Raines Law.

(G. R.) The possession of a $5 prescription license as provided in the recently amended Raines Excise law, allows you to sell liquors (bottled goods not excepted) only upon the written prescription of a regularly licensed physician. You may sell alcohol, except during prohibited hours (from 1 A. M. to 5 A. M., and on Sundays). Here is the text of the amendment in full:

> Section 11., Subdivision 3.—Upon the business of trafficking in liquors by a duly licensed pharmacist, which liquors can only be sold upon the written prescription of a regularly licensed physician, signed by such physician, which prescription shall state the date of the prescription, the name of the person for whom prescribed, and shall be preserved by the vender, pasted in a book kept for that purpose, and be but once filled, and which liquors shall not be drunk on the premises where sold, or in any outbuilding, yard, booth or garden appertaining thereto or connected therewith, there is assessed an excise tax to be paid by such duly licensed pharmacist or the corporation, association or copartnership of which he is a member, engaged in such traffic, and for each such place where such traffic is carried on by such pharmacist, or by such corporation, association or copartnership of which he is a member, the sum of five dollars. The holder of a liquor tax certificate under this subdivision may sell alcohol, to be used for medicinal, mechanical or chemical purposes, without a prescription, except during prohibited hours.

Acid Phosphate from Glacial Phosphoric Acid.

(W. A. H.) A dilute solution of glacial phosphoric acid may be prepared after the formula of the National Formulary. As you are probably aware, glacial phosphoric acid was introduced into the pharmacopœia of 1860 as a source from which the medicinal acid might be obtained. The process followed was:

Glacial phosphoric acid	1 tr. ounce
Nitric acid	40 grains
Distilled water	sufficient

Dissolve the glacial phosphoric acid in three fluid ounces of water, add the nitric acid, and boil until a syrupy liquid is left, to which sufficient water is to be added to make it measure 12½ fluid ounces. The product prepared by this process is no longer official. Dilute glacial phosphoric acid may, perhaps, be used as "acid phosphate" for dispensing at the soda fountain, but the majority of dispensers prefer the solution of acid phosphates of the National Formulary. Regarding the therapeutics of glacial phosphoric acid we would refer you to one of the dispensatories.

Glycerin, Alcohol and Water as a Liniment.

(T. P. A. K.) A mixture of glycerin, alcohol and water is seldom used as a liniment, and we know of no definite proportions for making such a combination. Mixtures of alcohol and water in varying proportions are used sometimes for rubbing one's muscles after arduous exertion, but it is not often that glycerin is added to them. Upon the other hand, toilet lotions are frequently made by diluting glycerin with water or with mixtures of alcohol and water as in the following:

Glycerin Lotion.

Glycerin	2 ounces
Water	2 ounces
Alcohol	2 ounces

Perfume if desired.

Here is a formula for an application for muscular lameness:

Glycerin	10 parts
Water	20 parts
Alcohol	70 parts

In your future communications please give us your employer's name and address as we notice your name is not on our list of subscribers.

Mange Liniment.

(F. D. B.) Mange in horses, cattle and dogs results from the attack of minute acari, which cause much itching and heat, accompanied with scurviness and baldness of the skin. The treatment consists, first in destroying the acari, and second in absolute cleanliness of the parts affected. According to "Veterinary Counter Practice" no better preparation for horses or cattle will be found than the following, which may be applied twice a day for a short time and afterwards once a day:

Sulphur vivum	4 ounces
Powdered white hellebore	1 ounce
Turpentine	1 to 4 ounces
Linseed oil, enough to make	24 ounces

When a milder treatment is required, particularly for dogs, mercurial ointment, or sulphur ointment, or a mixture of sulphur, tar, and linseed oil may be tried.

The Era Formulary gives the following formulas under "Mange Lotion":

(1) White hellebore	2 ounces
Tobacco	2 ounces
Water	3 pints

Boil, strain, and add when cold a pint of fresh lime water.

(2) Boil 4 ounces of white hellebore in 3 pints of water to 2 pints, add 2 drams corrosive sublimate previously dissolved in 3 drams of muriatic acid.

(3) Boil 2 ounces of tobacco in a quart of water; strain and add common salt 3 ounces, soap 2 ounces.

(4) Acid nitrate of mercury 2 drams, distilled water 16 ounces.

Shampoo Paste.

(H. M. W.)

(1) Castile soap, white	4 ounces
Curd soap, powder	2 ounces
Potassium carbonate	1 ounce
Honey	1 ounce

Perfume to suit.

Make a homogenous paste by heating with a sufficient quantity of water.

(2) White castile soap, in shavings	2 ounces
Ammonia water	2 fl. ounces
Bay rum, or cologne water	1 fl. ounce
Glycerine	1 fl. ounce
Water	12 fl. ounces

Dissolve the soap in the water, by means of heat; when nearly cold, stir in the other ingredients.

(3) Ammonia water	3 fl. drams
Cologne water	3 fl. drams
Alcohol	5 fl. ounces
Water	5 fl. ounces

Whites of egg, as many as desired.

The whites of egg (about two) are thoroughly beaten up previous to being mixed with the water and water of ammonia; the remaining ingredients are added in their order and the whole stirred briskly.

(4) Borax	2 ounces
Glycerin	1 fl. ounce
Rum	10 fl. ounces
Bay rum	10 fl. ounces
Whites of egg	2

Incorporate the borax in fine powder with the glycerin and add the bay rum and rum gradually and with constant stirring to the mixture. The previously well beaten white of egg is added last, and the whole stirred thoroughly until an even mixture results.

Pictures on Watch Cases.

(G. B.) We can give you but little assistance in this direction. Several manufacturers to whom we have applied for information say that more than one process is adapted to this kind of work, but they are trade secrets, the details of which are carefully guarded. However, here is a "film" process taken from Anthony's Photographic Bulletin (1892): (1) Make the negative on a transparent film in the ordinary way, as a glass negative will give a reversed image when finished. (2) Lay a piece of clean glass in the printing frame and place the film on it with the film side down. (3) Take a piece of transferrotype paper about the size of the desired picture and lay it on the negative. Then expose to lamplight for from 5 to 25 seconds, according to the density of the negative. (4) Develop with either ferrous oxalate or eiko. cum hydro. Then fix and wash in the ordinary way, taking care there is no alum in any of the solutions. This will give a reversed positive. The print should be considerably darker than the ordinary bromide print, as, when it is transferred to the watch case, the shining metal underneath makes it look very much lighter. (5) Take the washed print, trim to the desired size and shape (which can be done with a sharp pair of scissors while still wet), and lay face down, in its place, on the watch case. Place a piece of clean blotting paper on the print and press it with the finger into good contact with the watch case, taking care that the blotting paper does not slip and tear the print. Then put a weight on the picture, and set aside to dry. The watch case must be perfectly clean and free from oil and grease, or the print will not adhere. (6) When the print is dry, pour hot water (almost boiling) on it till the paper begins to blister. Then, with the point of a pin, lift one corner of the paper, which can be easily pulled off, leaving a film on the watch case. Rub the film with a tuft of cotton wool and warm water till it is perfectly clean and set aside to dry. (7) Take the picture when dry, and varnish with some good negative varnish and keep free from dust till it is perfectly hard. The picture is then finished.

Seidlitz Salts Containing Magnesium Sulphate.

(J. F. B.) An effervescing powder containing magnesium sulphate may be made after the general formula of the National Formulary for effervescent powders. (See that work, revised edition, page 119.) Here are some other formulas:

(1) Magnesium sulphate, crystal	25 ounces
Sodium bicarbonate	18 ounces
Tartaric acid	9½ ounces
Citric acid	6¼ ounces
Sugar	5¼ ounces

Dry the magnesium salt at a temperature of about 55° C. until it has lost nearly one-fourth (23 per cent.) of its weight; powder the product, and mix with the sugar and other ingredients all in fine powder. Then granulate the mixture by the heat method.

(2) Bicarbonate of soda	17 ounces
Tartaric acid	13 ounces
Citric acid	2 ounces
Sulphate of magnesium (dried)	1 ounce
Sugar	1⅛ pounds
(3) Bicarbonate of sodium	14 ounces
Tartaric acid	13 ounces
Chlorate of potassium	½ ounce
Sulphate of magnesium, dried	2 ounces
Sugar	2 pounds

Mix and pass through a dry sieve. Preserve in well-stoppered bottles.

Effervescing Saline.

(4) Sodium bicarbonate.
Potassium bitartrate.
Magnesium sulphate,
Magnesium citrate (effervescing).
Sugar, in powder, of each, equal parts.
Flavoring, as desired.

Dry each of the ingredients separately, then mix, and preserve in stoppered bottles.

A prominent cutter in a western city buys space in the newspapers for an advertisement reading

> The .... likes to encourage honest endeavor in aspiring youth, and cheerfully gives this free advertisement to its late chief prescription clerk, Mr. ....
>
> Who has recently purchased .... and who probably thinks, like other druggists, that he "can't afford to advertise." Mr. .... is a most competent pharmacist and a gentleman, and we cheerfully commend him to our friends residing in the vicinity of his new store. His two years' association with a REAL Drug Store has been a valuable apprenticeship, and he can be relied upon.
>
> "THERE'S ROOM ENOUGH FOR ALL."

This is philanthropy, sure enough.

——The 22d annual meeting of the Georgia Pharmaceutical Association will be held at Macon on the 18th and 19th of May. It has been ten years since the association met in Macon, and, says the secretary, "we intend to make this the very best and most profitable meeting of them all. We have not less than $400 worth of prizes, that will be offered in two dozen different pleasing contests that we have made a part of our programme. The railroad commissioners have granted a rate of one cent per mile returning, if full fare is paid going from any point in the State. When you purchase your ticket to Macon, ask ticket agent for a certificate, which when properly signed by the secretary, will secure for you the reduced fare."

THE PHARMACEUTICAL ERA

[*WEEKLY.*]

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Bound Volumes.

Our subscribers do not need to be reminded of the desirability of preserving their copies and keeping their files of The Era complete. We reserve of each issue a limited number of copies to supply orders from subscribers who have neglected to keep their files complete. Our supply of these back numbers is becoming rapidly depleted, and old subscribers are particularly requested to let us know soon of any back numbers which they may require for completing their files. With each successive year the value of a complete file of Eras is sure to be enhanced.

We can supply back numbers in bound volumes (Full Cloth) at the following prices, which include express charges, to any point within the United States. Foreign orders f. o. b. New York.

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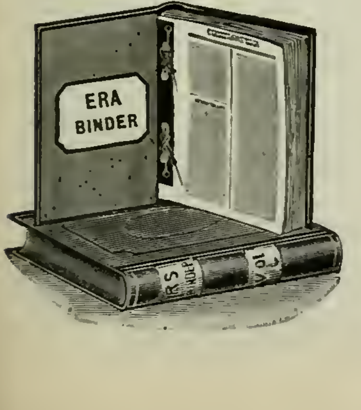

For the convenience of subscribers who preserve their copies of The Era, we furnish a useful binder which will hold the copies for six months (1 Vol.), with the advertisements, or the text pages only, for an entire year.

The "Era Binder," 75 cents per copy, post paid. To foreign countries, $1.00.

Punish the Scoundrels.

A well-known lawyer of this city in conversation with a representative of this paper recently complained that manufacturers of druggists' sundries and proprietary medicines were strangely lenient to swindlers. He said that manufacturers of other lines of goods than those intended for the drug trade often made it a point to pursue and punish any man or set of men who secured their goods through fraud, and the result was that such houses became known to the swindling fraternity and were let severely alone. In the drug trade his experience had been that the victims preferred to pocket their losses and swallow their chagrin.

The columns of the Era of late have shown that in drug circles there are exceptions to the lawyer's rule. Mr. Fraser is spending time and money to run to earth a couple of would-be blackmailers in Cincinnati. He said to a friend, who called upon him recently, that the actual cost in money of these prosecutions had exceeded many times the $2,000 bribe demanded of him, but he did not regret the expense. He said he thought there would be no more attempts at blackmail in Ohio for some time, and in the long run the reflex effect on his own business would be a good one, for every honest man would sympathize with him in his fight against rascality.

It takes a lot of faith to believe that "there is that that scattereth and yet increaseth," but the maxim is often verified. A weak man would pay out $2,000 rather than go to the expense and annoyance of a battle at law. He would look at it in the cold commercial light of debit and credit and take the cheaper course. But there is a higher law that operates in commerce as elsewhere. The weak man's reputation would be marred intangibly. Other swindlers and blackmailers would smell him out as if by instinct. In the long run, being conscienceless himself, he would become a prey for the conscienceless, and his goods would suffer in reputation likewise. By taking the bold course, Mr. Fraser has certified unmistakably to the general public that he himself is an honest man and that his medicines are pure. He defies investigation. He has made his name a terror to blackmailers and it is safe to predict that he will never have to go through such another experience as long as he lives.

This spirit is admirable, and if there were more of it in all lines of business these gangs of commercial highwaymen would be swept out of existence in short order. We are unable to decide whether the drug trade is any worse than other trades in this regard. Probably most business men think twice before sending good money after bad, as is necessary to do in order to punish malefactors. But therein lies the security of the malefactors. There are scores of letters on file in the office of this paper exposing the practices of the Gerrishes, Croshers, Schencks and others, and the usual request of the writers is, "Please do not mention my name." If the victims of these "brokers" would contribute only a small sum each, and then come out openly and tell what they know, it seems as if the whole conspiracy might be broken up. It is no disgrace to be caught by a sharper sometimes. On the contrary, it is often a sign of a large and growing business. Besides that, it pays to have the reputation of being a bad man for blackmailers and swindlers to tackle. The drug trade cannot afford to have the reputation among such gentry of being "Easy Fruit." Prosecute them to the full extent of the law every time chance offers, and in the long run it will pay you. The public loves to see scoundrels punished.

Parasites of the Drug Trade.

Readers of the Pharmaceutical Era often save many times the price of the subscription by the warnings contained in almost every issue against frauds, dead beats, swindlers and other pests of the business community. Within the last year the Era has saved to retail druggists many thousands of dollars by preventing them from subscribing to the stock of the Universal Trade Association. Another swindling concern which also holds forth in Detroit has been exposed in the Era. This is the American Drug Company, which collects fees from drug clerks who are out of work, but fails to find them the promised positions. Dr. Ferd. Rutland, of Chicago, who posed as president of the Wisconsin Eclectic Medical College, was thoroughly exposed by the Era, his business being to sell bogus diplomas to ambitious druggists and others who desire to practice medicine.

Lesser swindlers exposed in the Era have been such men as George Bronson, who visits the retail druggists of Ohio, Indiana and West Virginia, pretending to be a drummer for McKesson & Robbins. C. C. Kemp is another such swindler, who has operated in Pennsylvania and in Washington, D. C., pretending to represent the Kellar Pharmacal Company of Baltimore.

Similar swindlers to those just named, but operating on a larger scale, are Charles W. Hayward, who pretended to represent Smith, Kline & French Co., of Philadelphia, and who succeeded in borrowing money from a number of firms in New York City who sold goods to Smith, Kline & French Co. J. Jacobs and John R. Hicks, supposed to be one and the same man, hailing from Asheville, N. C., has also been exposed in the Era, having swindled a number of New York jewelers and wholesale druggists, and continuing his operations in various States South and West, at the expense of retailers as well as wholesalers.

The manufacturing trade has a special reason to be thankful for the painstaking investigation of a large number of brokerage and commission houses in New York City and elsewhere, which were accustomed to order goods on credit, but never to pay for them. Best known in this group, the members of which are believed to be confederates, is Henry P. Crosher, of 168 Greenwich street, son of James Crosher, who served a term in the penitentiary for stealing a copyright belonging to John Wyeth, of Philadelphia, as has already been stated in the Era. A former partner of his, who now operates under his own name, at the corner of Greenwich and Cortlandt streets, is F. L. Gerrish, who was first exposed in these columns as an officer in the defunct Perrine Drug Company, which was succeeded by the Vesey Import and Export Company, also defunct. Gerrish had formerly conducted a store at Fourteenth and Hudson streets, in the name of Willard B. Ellison & Co., defunct, which was succeeded by Wm. H. Sampson & Co., of 15 Dey street, afterward as 41 Dey street, also defunct. After the exposure Gerrish opened a store at 440 Greenwich street, which he was forced to sell, when again exposed, to J. D. Turner. After Turner's business was shown up in the Era he moved hastily to 517 Greenwich street.

F. L. Schenck was another bogus drug broker and commission merchant whose business was broken up by the Era. He moved from 35 Frankfort street, and kept shady until a few weeks ago, when he blossomed out under the nom de plume of C. Johnson, at 125 Elm street.

Henry V. Myers, of Ninth avenue and Thirty-fourth street, conducted a retail drug store in his wife's name as a blind, but was really in the business of "wholesale commission merchant and dealer in druggists' sundries." It was discovered that he was carrying on quite a large business, and disposed of his goods through Algernon Granville, a money lender in the neighborhod of the Tombs.

Wm. H. Schleigh, of Baltimore, was sentenced a few months ago to eighteen months in the penitentiary for this very offense of ordering goods with no intention of paying for them, and a Cincinnati gang, consisting of George R. Dixon, Martin Brockman and Charles Cook, who were most daring in sending out their orders, also fell into the hands of the law, as recorded in the columns of the Era.

The latest gang to recive attention at the hands of the Era is that of which William J. Hazard was the head. Hazard was convicted of grand larceny in the second degree, and the gang is now scattered. They hung out in the Downing Building, No. 108 Fulton street, in an office rented by William Stoothoff; and Rudolph P. Domschke, of that gang, posed as Mr. Stoothoff's employé. A Behrens, of 99 Maiden Lane, was one of the visitors at their office, and volunteered to answer for the respectability of the swindlers. As a result of the Era's exposure a saloon-keeper got after Stoothoff for passing a bad check, and Domschke, who has many creditors, fled the town.

Two bogus newspaper enterprises which proposed to bleed the trade have also been shown up by the Era. One of these, "The Medical Investigator," of Chicago, started by Paul Tarbell and conducted by Albert T. Armstrong, demanded of manufacturers of medicines' advertisements on veiled threat of unfavorable criticism. The other, under the title of "The United States Health Reports," of New York, conducted by a man named Greenlaw, fooled the credulous by pretending to represent the United States Government.

The number of bogus doctors and fraudulent medicine manufacturers exposed by the Era for the benefit of the general public and of the trade is very large, but space prevents a further résumé.

"Benefit of Clergy."

When the druggist is not harrowed by excise questions or worried by cut rates and kindred disturbing influence, the gentle public usually moves and seconds the proposition that the matter of Sunday closing be taken up for discussion during the interim. The druggists of the East End, Cleveland, Ohio, are now having this experience. They are being canvassed by a committee sent out by the church organizations, but newspaper reports indicate that the attempt to remedy this condition of affairs, which is deplored as much by druggists as by those who are working for reform, is meeting with indifferent success. The reason for this is one quite familiar to druggists. It is due to the fact that druggists are pretty much like other people. When associated together for the purpose of keeping an agreement the same difficulties beset them that afflict those worthy individuals who make railway traffic agreements or attempt to adjust the output of steel rails. There is always danger of a break. In the case of the druggist this pressure is one of great force. That portion of the unregenerated public which clamors for satisfaction of its desires upon Sunday is an overwhelming one in its numbers. It keeps the druggist busy guessing as to the classification of works of necessity and the other kind. He is becoming an adept at casuistry.

In this particular instance, however, a new force has been invoked, which gives peculiar zest to the situation. It is the suggestion that the movers in this reform employ that most contemptible weapon, the boycott, as a means for aiding the druggists in keeping in line. It seems that they do not ask for complete closing on Sunday, but simply during morning church hours. This temporizing policy may be but an entering wedge, and as such is possibly commendable from a worldly point of view. The success of closing for a few hours may in time become the argument for extension of the period. The outcome of this Cleveland movement, so far as a boycott is concerned, which confines the regular patronage of churchgoers to druggists who close on Sundays, is a matter of considerable interest.

Correspondence.

We are pleased to publish here communications from our readers on topics of interest to the drug trade. Writers are requested to express their views as briefly as possible. Each article must be sigoed by its writer, but his name will not be published if so requested.

Cleveland, Ohio, May 6.

To the Editor:

In regard to the commercial section of the A. Ph. A., let us see if we cannot get rid of our disagreeing points:

1. You desire to "do everything possible" to benefit the financial and business condition of the retail drug trade. So do I.

2. You say that it was impossible and out of place for the A. Ph. A. to do much good in that direction, yet you say you are "believers in organization and in having a national association of retailers to do nothing but consider trade and business matters."

As to the first, without a commercial section, it "was" I agree impracticable; with the latter, it is both possible and practicable, especially if you and all other drug journals who claim to desire the welfare of the retailers will work as heartily in favor of the commercial section as your "desire" should prompt you to. A united effort on the part of the drug journals, or most of them, in this behalf would insure success. It must not come in a day. Your argument that trade interests in different sections vary does not argue against those non-varying interests that are universal; a discriminating knowledge that there are such would coexist with the knowledge that each kind must be treated separately, and your admission that a national association is what you are in favor of is a complete backdown and admission that there must be some common commercial interests for which you advocate a national association. As to this national association, whether it should be a new organization or the Commercial Section of the A. Ph. A., those who realize how hard it is to get the live druggists to go to meetings must admit that the live druggists now attending the A. Ph. A. meeting cannot afford to attend still another meeting and loss of time; and yet this one body can easier be the center of attraction for all classes of discussion—educational, pharmaceutical, or business—than a new one.

Every State association and city association now loyal to the A. Ph. A. and sending representatives could and would enthusiastically send more delegates to their business or commercial section, and make it a success, if urged to do so, whereas they will scarcely aid a new organization. Now let us see how much you can do for such a result? What drug journals will be the true friend of the retailer? Don't all speak at once! I am afraid in the prolonged silence, I will have to say with Miles Standish, after his appeal to John Alden, his friend (?): "If you would have a thing well done, you must do it yourself." The signs of the times need not be studied, but the war is on in earnest! City after city is in revolution, and you journals are asleep to the fact! Every city will soon have its local organization and local pharmaceutical and proprietary goods advertised in their local papers, and their drug store windows ablaze with their own advertised goods, to the exclusion of the traitor sarsaparilla and pills and plasters. It will cost us less to advertise and catch the public ear and eye than it does the proprietor. The cutter—well, he will also sell his own stuff, and do as many of them are doing now, offer a premium to the clerks who sell his own instead of the thing called for—something which the true pharmacist will not stoop to do!

The drug journals have seen pharmacists as a class suffer abuse as substituters without raising their voice against the insult to pharmacy—merely because perhaps the advertisers were backing the contemptible libel, and all of them mum as a clam! The pretended friendship of the pharmaceutical press has a pretty gilt edge to it—but the real stuff isn't there.

NATHAN ROSEWATER, Ph. G., M. D.

THE PHYSICIAN FROM THE DRUGGIST'S STANDPOINT.

By JAMES A. ROBINSON, M. D., Pawtucket, R. I.*

(Concluded from p. 540, May 6.)

IV. The use and abuse of the prescription.

Next comes the most vital cause of the differences between the physician and the druggist, viz., the prescription and the abuses which arise from both parties.

When a physician writes a prescription he should remember that he is putting into it the knowledge which he has been many years in acquiring, and for which he has spent his money; that this is his principal hold on his patient, for if its contents are once known he has lost that patient and many others for cases with symptoms anything like those in the case for which the medicine was given. They can treat themselves and all the neighborhood, saving the cost of a doctor.

He should always remember that a prescription plainly written conveys a far better impression on all with whom it comes in contact than a carelessly written one, that a knowledge of compatibility and incompatibility makes a great difference in the looks of the product and also its efficiency; that chemical changes may occur which will defeat the object for which the prescription is given, and then the druggist is liable to blame if the result is not favorable.

The most conspicuous fault in the majority of prescriptions is the careless manner in which it is written, many physicians seeming to think that the worse the writing, the more profound and learned it seems. Now, if there is anything in the world which should be well written, it is a prescription, which carries with it the issues of life or perhaps death and thereby the reputation of the physician or the druggist according to which door the blame can finally be laid.

Many prescriptions come to the druggist which are deciphered with great difficulty, and when they have been delivered there remains with the druggist a sense of insecurity and a feeling of fear that the patient has not got what the physician intended.

The name of the drug should be plainly and fully written in Latin, no abbreviations being used, and greater care should be taken with the ʒ and ℥ signs. Many times the only thing which prevents serious mistakes is the druggist's knowledge of doses, it being impossible from the prescription to determine what quantity is called for.

To illustrate the difficulty, and sometimes danger of abbreviations and careless writing, I would mention a prescription which came into my store a few nights ago, in which among others were two ingredients, either spirits or syrups, at first glance impossible to decide from the penmanship, but apparently both sp. One was lemon and the other prunus virginiani. Now, as there is no spirit prun. virg., they were translated syr., and put up accordingly.

While this mistake of words in this case was easily corrected it shows what might happen in a case where two preparations of the same drug differing greatly in strength had similar abbreviations.

Write your prescriptions plainly and you will have less cause to blame the druggist for mistakes of which you think he is guilty.

In regard to the Sig. Always designate how large a dose you wish to give and how often you wish it taken. Also whether you wish it taken straight or whether you wish it diluted with water.

I have put up prescriptions containing irritant drugs, the ammonia preparations, for instance, where there were no directions to take them diluted, the patient did not remember of any being given and I have instructed them to dilute with water.

Perhaps from the doctor's standpoint I am getting out of my province by changing his directions, but it is always done with a desire to facilitate the action of the remedy and save his reputation as well as my own.

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*Read before the Pawtucket (R. I.) Medical Association. Reprinted from Atlantic Med. Weekly.

As this rarely comes to the doctor's notice he does not appreciate it, but it is done every day.

Never direct your druggist to label a prescription with the name of the ingredient unless you are willing he should know what he is taking. This is poor practice as it gives the patient a chance to refuse to take it on account of some prejudice he may have against the drug, and also cuts off just so much of your future income.

But if you ever find your prescription labeled with the name of the ingredient, go directly to your druggist, call for the original, and then if the druggist is to blame, read the riot act to him.

Unless you do this you may be at fault yourself and may charge him with what he is not guilty of, injure his business and create a warfare between you, when a little consideration of the grievance would result favorably for your future mutual friendship.

This was brought vividly to my mind by a prescription which came to me last summer, when we were having so many cases of sunstroke.

The prescription was:

R
Tr. digitalis .... ʒ j
Sig.—Digitalis.

It was filled, sent out, and nothing more thought of it for a week or so when a friend of mine, who is a physician, happened into my store, and in the course of his conversation told me that he had been called into a certain house in consultation.

The attending physician called his attention to this prescription labelled as above, and remarked that I was a pretty poor dispenser to label a prescription in that way, and being a physician I ought to know that we did not wish our patients to know what they were taking.

Then he wrote another prescription and told the people to go down street and get it put up as it ought to be.

After hearing him through, I showed him the original, a thing I never do, and no druggist should do unless his reputation is in danger.

As this physician sends me many prescriptions, I was justified in showing it under the circumstances.

If the doctor who wrote this prescription had been kind enough to call on me and find out who was to blame, the matter could have been settled very easily, but by not coming, the doctor to-day is probably under the impression that I have treated him unfairly and I know he has me.

The circumstance has had the result of injuring my reputation as a dispenser, in that family, at least, and in how many more, by their report of the circumstance, I do not know and probably never will.

I simply note this case to show how easy it would be to correct mistakes with your druggist and still retain friendship on both sides, and how easily you can, by not trying to see where the blame lies, make enemies of both to each other.

In regard to substituting on the part of the druggist there is no defense for his action, he is wholly in the hands of the physician, to be dealt with as he sees fit, and if he withdraws his prescriptions from him in the future he must take his punishment without a murmur, and the less he says about the matter the better.

Another source of complaint on the part of the physician is the refilling of prescriptions, and with no orders not to refill, and with the prescription as it is, I am really at a loss to say whether it is right or wrong.

The ownership of the prescription may be looked upon from three different standpoints, viz., the physician, the patient and the druggist.

The physician looks upon it as his written directions to the druggist to prepare the medicine for this case and the present time, the patient being simply the messenger.

The patient looks upon it as his property for which he has paid his money and which he can use whenever he sees fit, can keep it or give it away, or demand a copy.

The druggist looks on it as a voucher for his correct filling, can give a copy or not just as he chooses, as long as there are no orders to the contrary, for if the physician expresses no wish or command regarding it how can the druggist respect that command.

I say that I am at a loss as to whether refilling is right or wrong, because eminent legal lights have decided in favor of all three in different cases. If these legal lights cannot get at a solution of the problem, I cannot.

One remedy for this trouble which I think would help considerably, would be for each physician to have his own blanks printed for the purpose, and state plainly on them that "This prescription must not be refilled, neither must a copy of it be given except on my written order."

This would show the druggist that the physician considered the prescription his property, and knew what he wanted done with it. Then if the druggist refilled any, just withdraw your prescriptions from him. Nineteen out of twenty druggists would gladly obey this request of the physician.

As to the quality of drugs used, they should be the best, any druggist using cheap ones is guilty of substitution and should be treated accordingly.

I have tried to outline a few of the causes of the present relations between the physician and the druggist, and trust that my suggestions properly carried out, while they may not cure, will alleviate and by bringing the physician and the druggist into closer relationship, open the way to a final understanding and the existence of a friendly and co-operative spirit between the two.

QUEBRACHO TANNING IN URUGUAY.

The following report on tanning in Uruguay, says U. S. Consul Edgar Schramm, is based upon all the data obtainable, with a view of showing such new features in this branch of industry here as are unknown to our people at home. I am, to a great extent, indebted for my information to the firm of Lanza Hermanos, proprietors not alone of the largest tanning establishment of this country, but also of perhaps the largest boot and shoe manufactory in this Republic, furnishing outside of their own home demands, foot wear for some of the armies of the neighboring republics. These gentlemen have not only been kind enough to accommodate me with such detailed information as I needed partly for this report, but also have taken the trouble of furnishing me with samplse of the various qualities of leather, together with the process and material used by them for each kind of leather so tanned.

Mr. A. Lanza, one of the members of this firm, visited the United States as a delegate of the Pan-American Conference from this Republic during President Harrison's Administration, and has a great desire to see better and closer trade relations established between the United States and Uruguay.

The special feature of this report is that it brings to the notice of our people at home the use of a tanning material but little known to them, which in my judgment is of sufficient importance to warrant their attention. This material is a wood which grows in Upper Argentina and Paraguay in great quantity, and is named quebracho.

The fact that some few years ago an individual knowing the good tanning properties of quebracho made an extract from the chips and offal thereof at the place where these timbers were originally cut for various purposes and exported this extract to Europe led to a closer investigation, the result of which is the export of the timber itself for tanning purposes. Now, shiploads of quebracho go to Europe, and the export promises to increase from year to year as tanners get better acquainted with its valuable properties.

The fact that he entire log is ground up into a coarse kind of sawdust and thus used, goes to prove its great economic value, taking into comparison other tanning materials, where only the bark of a tree furnishes the desired qualities.

I am informed that the chemical tanning properties of quebracho, in proportion to oak bark, stands as follows: Quebracho wood, 12 per cent.; oak bark, 10 per cent.

As before stated, this timber grows abundantly in the northern part of Argentina and Paraguay. The principal cost and expense to be encountered in making quebracho marketable are in the cutting and shipping of it to the sea coast, first, because the wood itself is the hardest wood known, so that extra-tempered tools must be used in cutting it down, and, second, it is the heaviest wood known, considerably outweighing ebony, and therefore expensive to handle and transport.

Quebracho is a wood never known to rot; it withstands the water and underground use as well as the air, and gets harder from year to year. Extra-tempered tools, as stated, must be used in working it when green, and, when old, it becomes almost like metal. It is of a dark cherry-red color and takes a most beautiful polish. Furniture made of quebracho will almost last forever and is exceedingly beautiful.

Quebracho is here principally used for fencing poles, because of its lasting quality, and the larger timbers find ready use for water constructions, etc.

When used for tanning purposes, it comes in large logs, which are cut up into lengths of about five or six feet. These are put before a circular saw and cut up into strips of about three by three inches, and these pieces are again put into a machine consisting of a solid steel disk with numbers of projecting teeth—somewhat resembling the solid iron-wheel cornsheller—which runs with great speed, and cuts these pieces up into a coarse kind of sawdust, which is taken up by an endless belt of cups that conveys the now ready tanning material to its place of deposit.

The markets for quebracho so far are Montevideo, Buenos Ayres, and Rosario, and prices range from $10 to $15 per ton, according to demand and time of year, corresponding to the high or low waters of the Plate and other rivers by which these timbers are brought down.

In all these trading centers are men who either own such timber lands themselves and have their own steam tugs and flat boats to freight timbers to their places of business, or they make contracts with such landowners and send their own crews of men to cut it and fetch it down with their own conveyances.

In many cases, the timbers are even cut on lands seemingly having no owners at all, and no one takes the trouble of making inquiries as to the ownership of such lands or timber cut thereon.

There is no doubt that with the increased demand for quebracho, these lands will become very valuable, and, taking the present low prices of them into consideration, a lucrative investment might suggest itself, especially where investors would be in a position to utilize the product.

ANOMALIES AT LOW TEMPERATURES.

The discoveries of recent years have placed at the command of experimenters a range of low temperatures entirely beyond anything that used even to be dreamed of, and have hence opened a wide field for research. All the well-known properties of common bodies are being examined anew under these different conditions, and, as might be expected, some very curious things have been found out about the behavior of substances when subjected to the enormous degree of cold now at our disposal. Some of these are related by I. Van Geersdaele in Cosmos (Paris, March, 20) in an article, part of which is translated by Literary Digest, as follows:

"Below — 100° C. heat passes through all protecting envelopes with the same facility, no matter what their nature of their thickness. It is only above — 70° that the influence of the protective layer begins to show itself. At low temperatures all bodies become transparent to heat, as glass is to light; to try to keep in heat, therefore, by means of a protecting wrapper would be like constructing a dark chamber for photography with walls of clear glass."

Pictet tells us, says M. Van Geersdaele, that this phenomenon is similar to that presented by colored glass, which lets through—for instance—the red, or long, light waves, and stops the short, or blue ones. A woolen wrap in like manner keeps in the short heat waves, but allows the longest—"those that correspond to the gravest note in the heat scale"—to pass. Without discussing the orthodoxy of this explanation, we will pass on to the description of some of the liquids obtained by the action of intense cold and pressure on gases. At first sight, we are told, they might be taken for water. Says M. Van Geersdaele:

"Most of them are colorless; exceptions are oxygen, which is pale blue, and ozone, which is of a deeper blue.

"But if we examine the liquids a little more closely we shall see that they differ from water considerably. Beside the greater part of them, water and even alcohol produce the effect of a heavy, sluggish and viscous oil, so mobile are these new liquids. Their density is in general very small; that of oxygen and argon, however, is a little greater than that of water."

After telling us that all these liquids absorb the same parts of the spectrum as the gases from which they were condensed, showing that their molecules continue to vibrate in the liquid form just as they did in the gaseous, the author goes on to tell us of another interesting low-temperature optical property. He says:

"M. Pictet has studied the effects produced by great cold on phenomena of phosphorescence. He finds that for all phosphorescent substances known in physics there is a temperature, the same for all, at which, when placed in darkness, they no longer give out light. It is about — 70° that phosphorescence thus disappears.

"If we then allow the tubes containing the phosphorescent substances to return to ordinary temperatures, without subjecting them anew to the light, they soon begin to shine again and shine more and more as they grow warmer.

"On the other hand Dewar, operating at the boiling-point of [liquid] air (— 192°), while he has also proved that phosphorescence disappears at very low temperatures, remarks, in addition, that phosphorescent bodies, exposed to sunlight while they are at these low temperatures acquire, after being reheated, a power of emission much more considerable than in the normal state, so that gelatin, celluloid, paraffin, and ivory show well-marked phenomena of phosphorescence after exposure to the sun at a very low temperature. . . .

"When plunging certain substances into liquid air, Dewar noticed that the low temperature thus obtained had a very marked influence on the colors of these bodies. Thus vermilion and mercuric iodid, both usually of a fine scarlet, turn to pale orange; uranium nitrate, which is normally yellow, takes on a white tint. Blues and organic colors are not altered at this temperature. . . .

"The tenacity of metals and their stretching before breaking are also affected by great cold, both these properties increasing constantly as the temperature falls. . . . M. Pictet notices that metals gain in sonorousness when subjected to such a degree of cold. Thus at — 150° mercury and lead give a perfectly pure tone. Likewise a magnesium spring vibrates as if made of steel."

Considerable space is devoted by the author to a description of the great increase of power observed in magnets at these low temperatures, a steel magnet being able to sustain 50 per cent. more weight at — 105° than at + 30°, and oxygen, which in the gaseous form is very feebly magnetic, becomes so strongly so when liquefied that it will heap itself up about the poles of a magnet. He goes on as follows:

"Another physical property increases with the lowering of temperature—the electric conductivity of pure metals. All metals seem to tend toward perfect conductivity with falling temperature. . . .

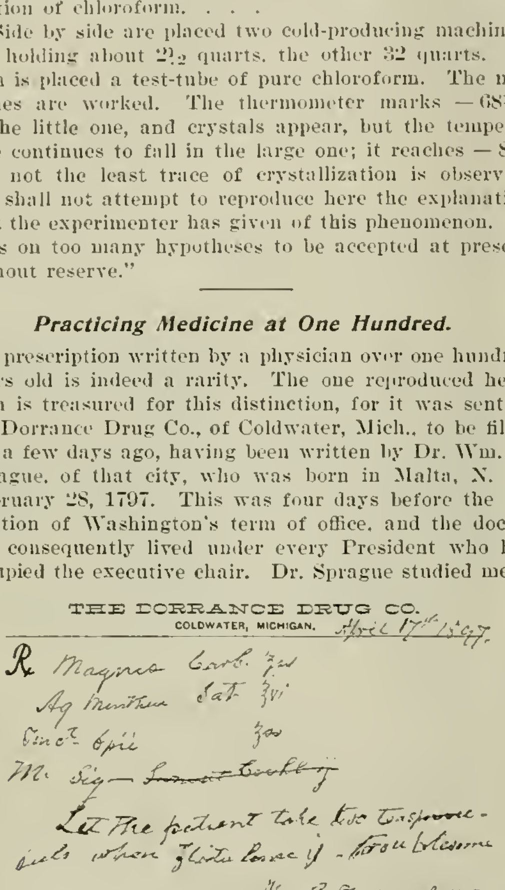
"But pure metals alone become better conductors of electricity with great cold. Alloys follow another law altogether—so much so that it has been recently proposed to base on this difference a process for measuring the purity of metals. This would be a valuable method, for it would make possible the analysis of the rare metals without any loss, or that of any precious objects whatever without injuring them.

"It remains to describe one last anomaly—the crystallization of chloroform. . . .

"Side by side are placed two cold-producing machines, one holding about 2½ quarts, the other 32 quarts. In each is placed a test-tube of pure chloroform. The machines are worked. The thermometer marks — 68½° in the little one, and crystals appear, but the temperature continues to fall in the large one; it reaches — 81° and not the least trace of crystallization is observed. We shall not attempt to reproduce here the explanation that the experimenter has given of this phenomenon. It rests on too many hypotheses to be accepted at present without reserve."

Practicing Medicine at One Hundred.

A prescription written by a physician over one hundred years old is indeed a rarity. The one reproduced herewith is treasured for this distinction, for it was sent to the Dorrance Drug Co., of Coldwater, Mich., to be filled but a few days ago, having been written by Dr. Wm. B. Sprague, of that city, who was born in Malta, N. Y., February 28, 1797. This was four days before the expiration of Washington's term of office, and the doctor has consequently lived under every President who has occupied the executive chair. Dr. Sprague studied medicine at the Medical College in Fairfield, N. Y., and after graduation moved to Penfield and thence to Honeoye Falls, where, in 1831, he married Miss Mary Smith, removing to Coldwater, Mich., in 1835. This remarkable instance of longevity argues the possession of exceptional faculties and a record of this life is that of the service which a good citizen renders and of the honors and esteem which are in return bestowed as a rightful tribute.



THE DORRANCE DRUG CO.
COLDWATER, MICHIGAN. April 17th 1897.

℞ Magnes Carb. ℥ss
Aq Menthæ Sat. ℥vi
Tinct. Opii ʒss
M. Sig— [illegible]
Let the patient take two teaspoonfuls when flatulence is troublesome

Wm. B. Sprague M. D.

——The annual meeting of the California Pharmaceutical Society will take place May 20 in San Francisco.

——At the 28th anniversary meeting of the New Jersey State Microscopical Society, held Monday, April 26, at Kilpatrick Chapel, Rutgers College, New Brunswick, Dr. F. B. Kilmer, of Johnson & Johnson, was among the exhibitors, showing section of sponge, bacillus pyocyanus, etc.

THE BOY IN PHARMACY.*

By RUDOLPH F. RUPPITER, Ph. G.

A very perplexing and knotty problem which assails the pharmacists of to-day, if their motives are the advancement of pharmacy as well as their own individual aggrandizement, is undoubtedly the problem of the elevation and perpetuation of their profession on scientific lines, and the avoidance of such retrogression as would reduce its votaries to the condition of mere shopkeepers.

Commercial Pharmacy.

There is a strong tendency toward this condition of shopkeepers. This tendency brings with it the concomitant lethargy resulting from a lack of practice in the scientific pursuit of pharmacy and a consequent ignorance which degrades the profession of pharmacy. It is unnecessary to dwell at any great length on the practices of a pharmaceutical shopkeeper. His drugs and chemicals are not examined for purity and strength, and preparations are purchased ready made or slapped together with a view to saving time, which is utilized in bewailing the trend of pharmacy and predicting an untimely and horrible end for it. His laboratory consists of a small table or other suitable surface covering a space of about 2 x 4, upon which are deposited a lot of dirty and empty bottles, and perhaps a funnel rack, and the physicians, after seeing it, prefer the preparations of manufacturers with better facilities. His clerk is a so-called "practical" man, who is practical in all things but the science of pharmacy, and the man with an honest and scientific knowledge of pharmacy is not needed in the laboratory. The prescription counter is reserved for a display of a knowledge of pharmacy, and here the operator's responsibility ceases when he has satisfied his mind that he will not become the chief actor in a homicidal catastrophe. The boy becomes the pharmacist's "devil," and as far as his training is concerned he is allowed to shift for himself. Such is a brief inventory of the main features in the conduct of the shop of a pharmaceutical shopkeeper, and to him we are indebted for the prediction that pharmacy is going to the dogs, to the devil, or to the physician.

Here it seems that an important branch in the art of pharmacy has been forgotten. Drugs merely pass through the pharmacist's hands, and he no longer is the safeguard which prevents the imposition of drugs of inferior strength and quality upon a suffering public: for he deals with a suffering public in the true and literal sense of the word. He will not plead an inability arising from ignorance; nor is it necessary, when the laws and usages of pharmacy, such as they are and which make his title of pharmacist valid, are taken into consideration, that he should generally do so. Such knowledge as he is forced to acquire might well form the basis for much good future work in the scientific practice of his profession, if he would but develop along such lines instead of considering his diploma or certificate as merely a permit to keep open a pharmacy shop. The lethargy which settles upon him as the result of an injudicious training and mental discipline has the direct effect upon his memory, primarily, of a soporific, which gradually merges into a stupor and then coma, as far as his scientific knowledge of pharmacy is concerned, until ultimately he becomes mentally and pharmaceutically fossilized, and practices pharmacy merely as a creature of habit.

Scientific Pharmacy.

The pharmacist shopkeeper undoubtedly will step out of pharmacy, and the outcome will be that pharmacy will establish itself on a surer and more scientific basis than ever. The mainstay of pharmacy must be the scientific practice of it, and I find on looking around that those who have convinced the public and the physician that they have made the nearest approach to it are the ones who complain least about what is taken away from them. How ridiculous it is to suppose that the life of pharmacy depends on the unnatural support given to it by side lines, etc.! Pharmacy first and side lines afterward. Dispensing physicians may cause the shopkeeper some alarm, but the scientific pharmacist fears them not, nor needs them. His reputation is mainly established with the public. The country doctor becomes a dispenser through necessity; the city doctor through choice; there is ample room left for the scientific pharmacist. He will not declare war against, nor depend wholly for his success upon, the physician; he knows that he is himself a necessity in all populous communities. The bloodless war of extermination will be between the pharmacist who keeps a shop and neglects pharmacy and the one who practices pharmacy at the same time that he keeps a shop; and the result must be a "survival of the fittest." We do not need the prognostications of a prophet to a foregone conclusion. Personal magnetism or mesmerism in isolated cases may hold out successfully against merit; quacks are sometimes more successful than physicians, but not generally so.

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*Portion of a paper printed in W. Dr.

There are, it seems to me, but two ways by which the pharmaceutical shopkeeping malady may be remedied, namely, by legal measures, or by measures that emanate from within the pharmacy itself. History may record the effects which the legal measures may produce. I wish to dwell on the means for overcoming this shiftlessness and lethargy which come within the jurisdiction of the intelligent pharmacist himself, and which appeal to his moral nature, as well as to his sense of right and wrong. It is the consideration of the qualification and the technical, intellectual and moral education, as well as the mental discipline, of that new element which is perpetually infused into the domain of pharmacy.

This, in brief English, is the drug-store boy, and the good or bad discipline which he undergoes as such is largely responsible for those habits which make him, as a man, predominantly either a shopkeeper or a scientist. The drug-store boy is father to the pharmacist. On account of the peculiar knottiness of the problem of which he is the embodiment, I have, with pardonable immodesty, I hope, ventured upon a few opinions and hypotheses relating to him, to his education and the betterment of his condition, with the belief that I may at least raise a discussion on this subject by abler pens, which will eventually unravel it and throw a ray of investigation and truth upon it. Too much stress can not be laid on the importance of the earlier pharmaceutical education of the boy and on his formation of habits of thoroughness. My deductions may be of some interest to my brethren in pharmacy.

The Boy.

Paradoxical as it may seem, the boy is not only the most abused and neglected factotum in a drug store, but fundamentally the stem and stamen of the whole profession of pharmacy. He is the embryo from which the pharmacist is evolved. I shall consider him in his various phases, and theorize a priori as to how the ideal boy drifts into a pharmacy.

His primitive drug-store-boy development begins usually about the close of his school days. He is then a shaver in short pants, perhaps, and can occasionally on his way home from school be seen peering through the windows of an apothecary shop with a wistfulness and eagerness which denote that the choice of a profession has already engaged his mind, and that he has a strong predilection to explore and fathom the mysteries of pharmacy, all stoppered up in the array of bottles, with gilt labels, upon the shelves. He has as yet no idea of cleaning those bottles, nor of the discipline and routine he shall have to endure to fill successfully even the shoes and position of the prosperous bald-headed elderly gentleman of whom he occasionally catches a glimpse through the window panes, with feelings of wonder and awe at the supposed profundity of his knowledge. "Straws show which way the wind blows," and famous and successful men have generally shown more or less youthful precocity—which is really nothing more than a natural liking which insures success—in the lines in which they respectively became famous or successful. This may be said to be the beginning of that type which constitutes at one and the same time the real and ideal drug-store boy, and the one whom we shall follow through the course of his career as such. There are many and various imitations, the most striking of which shall receive a passing notice.

There are boys who drift into drug stores by chance, without any qualifications or adaptabilities whatever; there are others who hire themselves out merely for the small pittance offered them at the outset; but the boy wanted is the one who has a real liking for this mixture of a mercantile and professional pursuit, and whose actions, showing a latent ambition to emulate the example of a successful pharmacist, are a sure token of a fundamental adaptability, implying, as this quality does, an ability to overcome the primary drudgery of the store to reach a higher position.

Not that all boys begin their apprenticeship at that period of their existence when they take off their knickerbockers and lay down the school books of a common school education! A common school education is often supplemented by a knocking-about for two or three or four years in other pursuits, until the favorable opportunity, as it is considered perhaps, is afforded of an apprenticeship in pharmacy. In the generality of cases such is, however, the intellectual status of the influx of apprentices, and it argues an exigency in the business which is not rapidly supplied by graduates of our higher schools. Graduates of our high-schools rarely enter the lists to become pharmacists, partly, I presume, owing to the false dignity which a smattering of knowledge engenders, and which renders them unsuited to the menial and trivial offices which are almost universally required of a drug-store boy. Where this false pride has not developed no one with any show of reason could contend that the graduates of such schools would not possess manifold advantages over the common-school boys. Unfortunately, such is not the source whence the vast majority of drug-store boys are drawn. We must take the drug-store boy as he is, and consider the conditions by which he is environed.

A most magnificent theoretical curriculum, indeed, might be prescribed for a boy, without any great difficulty, which, if carried out, would undoubtedly make him a pharmacist par excellence. The attempt, however, to carry out the plans of such a curriculum in the average drug store would be found to be attended with insurmountable obstacles. The ways of the world are not always conformable to theory, unless, indeed, that theory conforms largely to what is practicable. We must endeavor to keep this in view in dealing with the drug-store boy.

There are principally three classes of drug stores in which the boy is afforded an option to begin his career. There is the very large store in cities of considerable size, where an immense business is done, but not always a prescription business; then there is the store of medium pretensions, which represents the average, if not the majority, in the sum total of stores, where a prescription and general drug business is generally the engrossing occupation; and, finally, the very small store in rural and suburban districts, where the adventitious offshoots of pharmacy in the way of side-lines form the principal branches, but have often not even a remote connection with pharmacy. It may be unnecessary to add that there are a number of exceptions to this classification of drug stores. This does not alter the fact, howbeit, that the drug store doing a medium business, which is mainly and purely a prescription and drug business, is the one most suitable for the acquisition of pharmaceutical knowledge; and it is the fate of most boys who enter upon a pharmaceutical career to cast their lot with pharmacists conducting such stores.

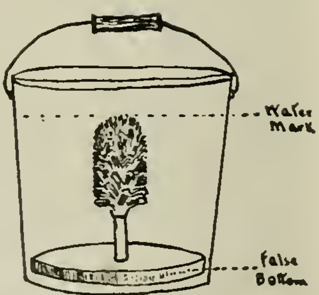
A common-school education is usually made to suffice, and, as it is received in this country, is usually sufficient to build a thorough pharmacist upon; and, in fact, the study and practice of pharmacy afford ample scope to engage all the energies and faculties of its votaries without allowing much time for such studies as do not come directly within its province. Specialization tends toward perfection, while a too promiscuous dabbling in the profound and various stores of knowledge tends toward the making of a "Jack of all trades, but master of none."

Pharmacy is a jealous art, which branches off in many directions and touches many sciences, but has no use or time for such as do not appertain to it. The kindergarten and common school of pharmacy are within the drug store, while the high school and university are the college of pharmacy. Apprentices enter pharmacy, as cadets enter the army and navy, for the purpose of learning their handicraft. They should be subjected to the same rigid discipline. The pharmacist should be as strict in the selection of his boy and in his education as the army and navy are in the selection and education of their cadets, and pharmacy would soon rank higher than it does among the professions. A competent pharmacist is usually a successful one.

Select a boy, then, who really has an ambition to become a pharmacist, and possesses at least a common-school education coupled with a good character, and at an age somewhere between fifteen and eighteen, as the most suitable one when impressions made upon the mind are retained there, and you have the conditions which are more than likely to insure a successful career for him He is the boy who will tell you when he applies for the position that his object is to become a pharmacist; not the one who says, "I don't know whether I shall like it." Instinct, if not reason, prepares the way in which men are destined to carve out their careers. Those who start solely with the purpose of finding easy passageways through life, unwilling to surmount those obstacles and difficulties which lie in the direct path of all pursuits that lead to somewhere, and follow up the trails of ease and indolence, are eventually lost in the mazes of such a course, and arrive at—nowhere.

A Home Made Tumbler Washer.

J. L. Klicka, 1714 East Ravenswood Park, Chicago, sends an illustration and description of a home made tumbler washer which is constructed as follows: "Take an ordinary wooden water pail and make a false bottom about three-fourths of an inch thick, to fit inside. Cut off the handle of an ordinary tumbler brush about an inch or an inch and a half from the bristles. The brush is then secured by a screw through the false bottom and into the end of the handle so that the latter stands upright in the center of the false bottom. The false bottom is then nailed fast to the bottom of the pail A small quantity of washing soda is placed in the pail, which is then filled with water to the top of the brush, or about two-thirds full. To clean tumblers they are simply placed over the brush and given a twist and then rinsed out in clean water."



FORMULAS FOR THE SODA FOUNTAIN.

Leghorn Chocolate.[2]

Chocolate syrup	1 ounce
Vanilla syrup	½ ounce
One egg.	
Piece of ice size of walnut.	

Shake well together, add plain soda, and pour from shaker to glass three times; top off with nutmeg.

Chocolate.[1]

Van Dyck's soluble cocoa	6 ounces
Boiling water	½ gallon

Stir in the cocoa until the mixture is perfectly smooth and uniform. Then boil for one minute, and add seven pounds best granulated sugar. Continue the heat until the mixture again boils, stirring constantly. Remove from fire. When cold add half an ounce S. & P. extract vanilla and mix well.

Pineapple Smash.[4]

Pineapple syrup	1 ounce
Shaved ice	½ tumblerful
Powdered sugar	1 teaspoonful

Add soda-water, large stream, strain in small tumbler, and add a piece of pineapple.

Egg Lemonade.[4]

Shaved ice	½ tumblerful
Fresh egg	1
Juice of one large lemon.	
Powdered sugar	3 heaping teaspoonfuls
Spring water	6 ounces

Shake thoroughly. Draw small quantity soda-water, fine stream only, and grate a little nutmeg on top.

Tonique Fizz.

Shaved ice	⅔ glassful
White of egg	1
Dashes of angostura bitters	3
Dashes of lime juice	4
Dashes of phosphate	8
Powdered sugar	3 spoonfuls

Shake, do not strain, and fill glass up with vichy. Stir with mixing spoon.

Siberian Flip.[4]

Shaved ice	½ tumblerful
Orange syrup	1 ounce
Pineapple syrup	1 ounce
Acid phosphate	1 dram
Angostura bitters	2 drops

Shake well, and fill glass with soda-water. Add a very thin slice of orange and pineapple, and serve with two straws in a 12-ounce glass.

Clarique.[4]

Shaved ice	½ tumblerful
Claret	2 ounces
Lemon syrup	1 ounce
Powdered sugar	3 teaspoonfuls

Draw soda-water, large stream, and place a few strawberries on top.

Tulip Negus.[3]

Claret syrup	1 ounce
Peach blow syrup	1 ounce
Orange cider	4 ounces
Shaved ice	¼ glassful

Draw full of soda using fine stream and mix with mixing spoon.

Marshmallow Syrup.[2]

J. H. Barker & Co.'s rock candy syrup	7 pints
Powdered gum acacia	10 drams
Orange flower water	4 ounces
Citric acid	4 drams
Water enough to make	1 gallon

Orange Sherbet.[2]

Vanilla syrup	1 pint
Pineapple syrup	1 pint
Orange syrup (made from fresh fruit)	1 pint
Sherry wine	4 ounces
Grape juice	2 ounces

Dispense 1½ ounces in mineral glass, with crushed ice.

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[1] Smith & Painter's Catalogue.
[2] J. H. Barker & Co's "100 Fountain Formulas."
[3] Bonham's "Modern Guide for Soda Dispensers."
[4] Tufts' Book of Soda Water Syrups.
[5] Western Druggist.
[6] Era Formulary.

Arctic Sherbert.[2]

Sherbet Syrup:

Pineapple, strawberry and vanilla syrups, equal parts.	
Claret wine	8 ounces to gallon

Color red with solution carmine.

Solution No. 1:

Oil sweet orange (must be fresh)	1 ounce
Alcohol	1 pint

Color to golden tincture curcuma.

Solution No. 2:

Citric acid	8 ounces
Water to make	1 pint

Color with solution carmine.

Put No. 1 and No. 2 in separate squirt bottles. Take large mineral glass holding 10 to 12 ounces, fill same one-third full of fine-shaved ice, and add one ounce sherbet syrup, one dash of No. 1 and No. 2, or three dashes of No. 2. Fill glass with soda (draw solid), stir with spoon, and serve with straws.

Mead Syrup.[2]

Cloves	½ ounce
Nutmegs	2 drams
Coriander	2 ounces
Jamaica ginger	2 ounces
Allspice	½ ounce
Cinnamon water	4 ounces
Alcohol	4 ounces

Pulverize the spices coarsely, and macerate them for 24 hours in the alcohol and cinnamon water; then transfer the whole to a percolater and pour on dilute alcohol till 16 ounces of fluid is obtained; percolate slowly, and to the mixture add one-half ounce of genuine orange flower water. For dispensing at fountain take of the above compound 1 ounce and rock candy syrup 2 pints.

Whipped Cream Syrup.[6]

Gum acacia	2½ pounds
Crushed sugar	7½ pounds
Tincture of quillaja	10 fl. ounces
Benzoic acid	1½ drams
Hot water	5 pints

Dissolve the finely sifted gum in the hot water; strain then dissolve the sugar in the clear solution with the aid of a gentle heat, and add lastly the tincture of quillaja and benzoic acid.

Carbonated Cream.[4]

Powdered sugar	3½ pounds
White of six eggs.	
White glycerine	½ pound
Water	1 gallon

Dissolve sugar in water, add glycerine and mix well. Take eggs (white), beat with a "Keystone" or "Dover" beater, and add to the dissolved sugar. Then add to 5 gallons of water, and charge at 125 pounds' pressure. Draw syrup and carbonated cream in one glass, and put shaved or cracked ice in another glass. On the ice draw the carbonated water, and mix with the syrup and carbonated cream by pouring together. Do not draw syrup and carbonated cream in a glass and then turn on a fine or mixing soda stream, as sufficient water cannot by that means enter into the drink. Do not add the ice to the syrup and carbonated cream, for it will flatten the drink, but put it in separate glasses as directed.

Charlotte Russe.[4]

Shaved ice	½ tumblerful
Vanilla syrup	1 ounce
Cream	6 ounces
Egg	1

Shake well and fill with soda water, using fine stream. Serve in a 14-ounce tumbler, and with a spoon. It will have a head like a Charlotte Russe.

Cherry Cocktail.[3]

Cherry juice	1 ounce
Orange cider	2 ounces
Powdered sugar	1 spoonful
Dashes of bitters	2

Shake with a little shaved ice, strain into a cocktail glass and fill up with soda. Add a couple of cherries.

Cherry Bloom.[2]

Extract cherry	6 drams
Extract strawberry	2 drams
Extract vanilla	1 ounce
Citric acid	2 drams
Rock candy syrup	1 gallon

Cochineal color to make red.

One and one-half ounces of this syrup to be used to each glass. The glass to be filled with crushed ice and the soda water squirted in with a fine stream, so as to thoroughly mix the syrup, and not to melt too much of the ice. Serve with straws.

Grape Ambrosia.[2]

Use whites of 18 eggs, beat to a froth, and add sugar, 5 pounds; mix both well, and add:

Sweet milk	1 gallon
Water (pure)	2 gallons
Good grape juice (Welch's)	2 quarts
Grated pineapple	2 cans
Fruit acid	2 ounces
Essence lemon	¼ ounce

Mix all well in a freezer. Let the mixture stand, after being well packed, for an hour or so to become harder. Serve same as ice cream.

A La Champagne.[5]

Œnanthic ether	1 dram
Tincture celery	30 drops
Tincture balsam peru	30 drops
Amylic ether	2½ drams
Tincture vanilla	3 ounces
Lemon juice	32 ounces
Neutral spirit, 94 per cent	8 ounces
Syrup, enough to make	1 gallon

The flavor is said to resemble champagne, and to make a magnificent soda fountain drink. It is also known as Creme de Bouzy Lemonade.

Hyacintha Flavor.[5]

Safflower	4 drams
Juniper berries	2 drams
Dates	2 drams
Raisins	2 drams
Aniseed	15 grains
Cinnamon	15 grains
Coriander	8 grains
Mace	8 grains
Clove	8 grains
Alcohol, dilute	19 fl. oz.

Prepare a tincture by maceration, and use for flavoring syrup, which is to be served "solid" with charged water.

Pepto-Limetto.[3]

Lime juice	18 ounces
Essence of pepsin	1½ ounces
Fruit acid	½ ounce
Foam extract	½ ounce
Simple syrup	3 pints

Mix thoroughly and color with a few drops of turmeric. This, when served with soda water, makes a delicious refrigerent tonic, and an agreeable appetizer.

Limona Mint.[5]

Spirit peppermint	4 fl. drams
Lemon juice	4 fl. ounces
Solution citric acid	1 fl. dram
Syrup, enough to make	32 fl. ounces

Dispense either "solid" or foamed. In the latter case gum must be added.

Crab Apple Tonic Syrup.[5]

Sweet cider	1 gallon
Sugar	7 pounds
Extract malt	4 fl. ounces
Solution citric acid	1½ fl. ounces

Evaporate the cider to 4 pints, in this dissolve the sugar, strain and add the remaining ingredients. Serve either "solid" or with foam.

Blood Orange Syrup.[6]

Juice of fresh oranges	2 pints
Water	2 pints
Sugar	6 pounds
Cherry juice (to color, about)	½ pint
Citric acid solution (1 part in 2)	1 fl. ounce

Nerve Food Syrup.[6]

Oil sassafras	15 minims
Oil wintergreen	15 minims
Alcohol	1 fl. ounce
Fluid extract gentian	1 fl. ounce
Syrup sarsaparilla compound, U. S. P.	8 fl. ounces
Caramel	1 ounce
Syrup sufficient to make	5 pints

Dissolve the oils in alcohol and add to the other ingredients, previously well mixed. Serve in mineral glasses, first drawing the glass two-thirds full of soda water, then add ¾ to 1 ounce syrup and sufficient soda water to fill glass without undue foaming.

Orange Phosphate.[2]

Select Messina oranges	90
Oil of sweet orange (Sanderson's)	5 drams
Granulated sugar	10 pounds
Genuine rock candy syrup	7½ gallons

Grate the peel of the orange, being careful not to get any of the white, spongy portion, which has a tendency to render the syrup somewhat bitter. After carefully grating the oranges, mix with the oil and ten pounds of sugar; beat it well in a large mortar for two hours, and put in a wide-mouth jar, and allow to macerate for forty-eight hours. Then add the rock candy syrup in its condensed form. Strain carefully through cheesecloth. Heat should not be employed. Use syrup with a dash of phosphate to each glass.

Red Orange Phosphate.[1]

Red orange syrup	1 ounce
Acid phosphate solution	1 teaspoonful
Plain soda	7 ounces

Mix the syrup and acid phosphate and draw coarse soda stream till glass is full; stir with spoon. Serve in 8-ounce mineral water glass.

Cranberry Phosphate.[1]

Cranberry fruit syrup	1 ounce
Acid phosphate solution	1 teaspoonful
Plain soda	7 ounces

Draw coarse soda stream till glass is full and stir with spoon. Serve in eight-ounce mineral water glass.

Egg Phosphate Syrup (Simms').[1]

Extract vanilla	2 drams
Lemon syrup	2 pints
Orange syrup	1 pint
Jamaica rum	6 drams
Acid phosphate solution	4 drams
Sherry wine	2 ounces

Raspho.[5]

Raspberry syrup	¾ fl. ounces
Orange syrup	1¼ fl. ounces
Tincture ginger	1 dash
Acid phosphate solution	1 dash

Serve in a tall, 12-ounce thin mineral glass, drawing on the carbonated water, placing plenty of finely shaved ice into the tumbler before drawing the syrups. Serve with straws. The ginger is the distinctive feature.

Extract Cascara Sagrada for Fountain.[6]

Oil, cinnamon, true	1 dram
Oil cloves	2 drams
Oil nutmeg	80 drops
Tincture tolu	12 drams
Tincture ginger	12 ounces
Fluid extract cascara, tasteless	16 ounces
Carbonate of magnesium	2 ounces
Water enough to make	4 pints

Triturate the oils, tinctures and fluid extract with the carbonate of magnesium, gradually add water, and pass water through the filter to make 4 pints.

To make the syrup for the fountain, take

Cascara extract (as above)	6 ounces
Flavoring extract orange	2 ounces
Syrup	1 gallon
Solution gelatin or soap bark	1 ounce

Color with caramel if necessary.

Ice Creams.[1]

Vanilla.[1]

Cream	3 pints
Sugar	¾ pound
Vanilla sugar	¾ ounce

Cook these in a farina boiler till the sugar is entirely dissolved, strain through a coarse hair sieve into the freezer and freeze. As the seeds of the vanilla in the vanilla sugar are wanted in the cream, do not use a fine strainer.

Chocolate.

Cream	3 pints
Sugar	¾ pound
Cocoa (Van Dyck's)	1¼ ounces
Vanilla sugar	½ ounce

Cook the cream, sugar and vanilla sugar as directed for vanilla cream. Work the cocoa with a gill of boiling water to a smooth paste; add this to the hot cream, strain through fine muslin, cool and freeze. Too much cocoa makes the cream dark and rough and destroys its delicate flavor.

Pineapple.

Pineapple juice	½ pint
Lemon juice	1 tablespoonful
Sugar	½ pound

Dissolve the sugar in the mixed juices and set aside in the refrigerator or on ice to cool.

Cream	1 quart
Sugar	½ pound

Cook these in a farina boiler, or other water bath, until the water in the outer pan boils and the sugar is dissolved. Put this on ice to chill. When thoroughly cold add the prepared and cooled juices and sugar, and put all in the freezer. Turn the crank slowly till it goes hard. Take out the dasher, scrape down the hardened cream from the sides, and beat the ice cream with a wooden paddle till smooth. Close the can, draw off the brine, fill up the tub with ice and salt, and put the freezer in a cool place until the ice cream is wanted.

Cherry.

Cherry juice	¾ pint
Sugar	½ pound

Dissolve the sugar in the juice.

Cream	1 quart
Sugar	½ pound

Cook and proceed as for pineapple ice cream.

These ice creams may be made without cooking the cream, if desired, using the ingredients in the same proportions. When so made, dissolve the sugar in the cream by stirring. Put these in the freezer, and when partly frozen stir in the cold fruit syrup, prepared as directed in the recipe. Continue the freezing till the crank turns hard. This method requires less time and makes very fine ice cream, but hardly of so rich a body as when the cream is properly cooked.

PHARMACY.

The semi-annual report of Schimmel & Co., Leipzig and New York, issued under date of April, 1897, contains as usual much information upon essential oils, and the following items are abstracted therefrom:

ALMOND OIL, PRESSED FROM PEACH AND APRICOT KERNELS.—The recent official report in the "Deutsches Handels-Archiv" gives the following interesting information on the importance of the production of apricot kernels in Syria.

"The apricot is abundantly cultivated in the vicinity of Damascus, where the soil is very favorable. Great care and attention is bestowed upon the cultivation. The bitter kernels (mish-mish) without the hard shells are exported to Europe, mostly to Hamburg and Antwerp, where the fat oil is expressed. In the year 1895, with a slighter average crop of about 300,000 kilos of apricot kernels, worth about 160,000 francs, besides about 800,000 kilos of dried, pressed apricots, worth about 400,000 francs, were exported to Europe. The cakes of dried and pressed apricots go mostly to France, England and Triest."

New additions to the commercial apricot kernels are those exported from China and Japan, the former of which excel in size. Twenty sample bales of Australian apricot kernels were recently obtained; they are in size and quality almost equal to the Chinese kernels.

Considerable consignments of apricot kernels will probably be shipped for the first time from the United States this year, where these kernels hitherto have been thrown away as useless. Since peaches and apricots are cultivated there in enormous quantities, the exports of kernels from there may soon become an influential factor in the market and the prices of this commodity.

CHAMPACA OIL, from the fresh flowers of Michelia champaca L., has a slightly brownish color, a sp. gr. of 0.938, a rotatory power of — 32° 8' and a saponification factor of 77.3. It is soluble in absolute alcohol, but an alcohol containing only 10 per cent. of water used in the proportion of 1 part of oil to 10 parts of alcohol renders a turbid solution. The odor has a faint similarity to that of ylang-ylang oil, and contains like this, also benzoic acid, which we have isolated and identified.

BASILICUM OIL.—Since the composition of this oil as yet has not been exactly known, an examination was recently made in our laboratories, the result of which will shortly be published in a paper in the "Archiv der Pharmacie."

An oil received from the island of Réunion was first examined, the principal constituent proved to be methylchavicol, which upon oxidation by potassium permanganate gave homoanisic acid and anisic acid.

When heated with sodium alcoholate, methylchavicol is completely transformed into anethol.

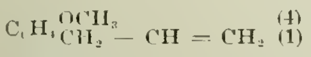
The oil contained 60 per cent. of methylchavicol as determined by Zeisel's method of the determination of methyloxide.

Secondary constituents of the oil are:—

1. Pinen $C_{10}H_{16}$, characterized by nitrolbenzylamine melting at 123°.
2. Camphor $C_{10}H_{16}O$, melting point of the oxime 118°, and
3. Cineol $C_{10}H_{18}O$, found by Wallach's hydrobromic acid compound, as also by the iodol reaction.

The next examination was made with an oil distilled by us from fresh basilicum herb from our experimental fields at Miltitz. This oil considerably differs in odor and in physical properties from Réunion oil; it contains only 25 per cent. of methylchavicol, and also some cineol, but no camphor. Besides these constituents, we found German oil to contain a considerable quantity of an alcoholic substance whose nature has not yet been ascertained by us.

Messrs. Dupont and Guerlain (Compt. rend. 124, 300) report on their examination of a French basilicum oil. They have also found methylchavicol (estragol)



$C_6H_4\genfrac{}{}{0pt}{}{OCH_3}{CH_2 - CH = CH_2}\genfrac{}{}{0pt}{}{(4)}{(1)}$ and have characterized it by transforming the same into anethol, thereby furnishing the evidence of the presence of anisic acid in its products of oxidation.

They further have shown the French oil to contain a considerable quantity of linalool of the optical rotation of $\alpha D = -14.03°$.

CULILABAN OIL.—The distillation of culilaban bark from Cinnamomum culilavan Nees, 4 per cent. of oil, having a sp. gr. of 1.051, a strong odor of eugenol; on account of its dark color the determination of its rotary power could not be made.

The phenol contained therein was isolated by agitating the oil with dilute solution of sodium hydrate and by subsequent separation by means of dilute sulfuric acid. The phenol obtained had a boiling point of 251° to 253° and a sp. gr. of 1.071 at 15°, corresponding to those of eugenol. The benzoyl compound obtained therefrom has the same melting point as benzoyl-eugenol, 70° to 71°. The phenol of culilaban oil, therefore, is identical with eugenol.

The remainder of the oil, deprived of the phenol, boiled at 100° to 130° under a pressure of 10 mm.; the main fraction, boiling at 125° to 130°, was heavier (sp. gr. 1.031), the fractions with a lower boiling point were lighter than water. The main fraction distilling at 249° to 252° under common atmospheric pressure yielded upon oxidation by means of potassium permanganate verartic acid with a melting point between 179° and 180°.

The silver salt crystallizing in needles from a water solution was used for analysis; 0.2508 gm. of silver salt yielded 0.0938 gm. ag:

calculated for $C_9H_9O_4$ Ag	found
37.37 per cent. Ag.	37.40 Ag.

This result, as well as the boiling point of the fraction indicate, methyleugenol. By bromation of a part of the fraction, tribrom-methyleugenol melting at 77° was obtained.

According to the result of this examination culilaban oil consists mainly of eugenol, and contains besides some methyleugenol and a small amount of constituents of a lower specific gravity than water.

DAMIANA OIL FROM LEAVES.—Damiana leaves, originating from Mexico and said to be collected from various Turnera species (Turnera diffusa Ward, and Turnera aphrodisiaca Ward), were first distilled by us in 1888 (see Report, April, 1888). A consignment of leaves distilled last year yielded 1 per cent. of oil; this had the following properties:—sp. gr. 0.943, while the specific gravity of oils formerly distilled was much higher, amounting to 0.970 and 0.986; opt. rot.—23° 25'; the oil contained saponifiable constituents, and we ascertained its saponification factor to be 41.8. When standing in a cool place, crystalline separations occurred on the surface similar to those initiating the solidification of oil of roses. It may, therefore, justly be deduced that damiana oil also contains paraffin. The oil has not yet found any practical application.

TEA OIL.—Tea contains, according to the older statement of Mulder (Husemann and Hilger: Die Pflanzenstoffe), 0.6 to 1 per cent. of essential oil. We have, however, in no case succeeded in obtaining more than mere traces of oil and suppose that the tea then in Mulder's hands had been so much flavored that any ethereal oil obtained on distillation was due to this artificial flavoring.

From a paper contained on page 119 in the Report on the Botanical Garden in Buitenzorg, of the year 1895, it becomes, however, evident that tea oil exists, and is obtained when the leaves are distilled immediately after the process of fermentation, in use in their preparation for commerce.

As this paper offers a number of interesting points, we recapitulate its main contents:

When rolled tea, after having been exposed to fermentation for 3 or 4 hours, is distilled with water, a distillate is obtained which possesses the strong odor of fermented tea. By careful cohobation some essential oil can be obtained from this distillate. Besides this oil, a portion boiling below 75° can be obtained from this water by repeated distillation. From this portion methylalcohol boiling at 66° was obtained by dehydration by means of anhydrous sulfate of copper. The identification of this alcohol was obtained by the reaction with nitromethyl-metaphenylendiamine, as also by its transformation into oxalicacid-methylester, melting at 51°, and by the formation of methyliodide. The presence of methyl-alcohol in unrolled, not yet fermented tea leaves had already been ascertained by Dr. van Romburgh.

The yield of oil was very small, amounting to only 1 cc. from 15 kilos of leaves, equal to about 0.006 per cent. There are experiments in progress for ascertaining whether the yield of oil is in any way influenced by the extent of the fermentation; so much, however, can be stated that the amount of oil decreases with the duration of fermentation.

The oil had a specific gravity of 0.866 and a laevogyrate rotation of 0° 11′ in a 200 mm. tube. By fractional distillation, two main portions of the oil were obtained, one boiling below, the other above, 170°. Continued fractionation of the portion boiling below 170° yielded a colorless liquid, boiling between 153° and 154° under 740 mm. pressure, having a somewhat pungent, fusel oil like odor, strongly recalling that of tea. Elementary analysis and determination of the vapor density by V. Meyer lead to the formula $C_6H_{12}O$. When boiled for two hours with potassium solution, the substance remained unchanged, nor did it give a compound with hydroxylamine. When treated with sodium solution and chloride of benzoyl, a liquid compound of a faint odor resulted, which after saponification yielded benzoic acid and the original substance. When boiled with anhydrous acetic acid, an acetic ester boiling at 160° to 165°, and when heated with strong hydrochloric acid to 100° in a closed tube, a chloride boiling at 120° were obtained.

These reactions indicate that the liquid under examination is of an alcoholic nature. It readily absorbs bromine. The bromine addition product is not effected by potassium permanganate solution in the cold, while its original alcohol is effected upon warming. By oxidation with potassium bichromate and sulfuric acid, a fluid is obtained which has the odor of butyric acid and after treatment with calcium carbonate produced a lime salt containing 18.5 per cent. of Ca. Calcium butyrate contains 18.6 per cent. of Ca. By the oxidation with potassium permanganate in an aqueous solution, a calcium salt with 18.6 per cent. of Ca was obtained. The formation of a trivalent alcohol could not be ascertained.

It is remarkable in what a brief time the essental tea oil originates during the fermentation. Its formation may be caused by a process of oxidation, perhaps under the influence of a body like the laccase of Bertrand, and the oil may be formed, with the aid of some ferment, from a glucoside contained in te tea leaves.

THE PRODUCTION OF LARGE ARTIFICIAL DIAMONDS.—U. S. Consul Germain, of Zurich, sends, February 4, 1897, the following (Consular Report):

Diamonds of a very small size have been produced artificially heretofore, but no one has yet succeeded in producing large ones. Mr. E. Moyat claims to have discovered a new process by which to produce diamonds of large dimensions. In principle, his process is about the same as the one already invented by others, and that is to obtain crystallized carbon out of iron and coal, by means of high pressure and high temperature. Yet there is some improvement in the Moyat process as regards the technical operation. Pulverized coal, iron chips, and liquid carbonic acid are placed in a steel tube and hermetically sealed. The contents are then subjected to the action of an electric arc light by means of two electrodes introduced into the tube. The iron liquefies, is then saturated by part of the pulverized coal, at the same time the liquid carbonic acid evaporates, thereby creating an enormous pressure on the mixture of iron and coal. This pressure again considerably increases the dissolution of the coal in the liquid iron. While the mixture is cooling, the carbon crystallizes partly in the form of real diamonds and partly in the form of similar stones. These crystals are then segregated by dissolving the iron in diluted muriatic acid. The mixture, by the above method, remains under high pressure during the operation of the electric current, while by other methods the pressure is obtained later on only by means of the rapid cooling process of the crucible.

QUESTION BOX

The object of this department is to furnish our subscribers with reliable and tried formulas and to discuss questions relating to practical pharmacy, prescription work, dispensing difficulties, etc. Requests for information are not acknowledged by mail and ANONYMOUS COMMUNICATIONS RECEIVE NO ATTENTION.

Unanswered Queries.

G. H. Smith, Kansas City, Mo.; Clay W. Parsons, Lockport, N. Y.; John Robinson, Green Bay, Wis., and Bergqvist Bros., New Britain, Conn., are not upon our list as subscribers, and as they fail to state whether they are clerks in the employ of subscribers, we can give their queries no attention. This department is not maintained for the benefit of outsiders. See rules at the head of this department.

Board Secretaries' Addresses.

(R. L. R.) The secretary of the Maryland Board of Pharmacy is H. P. Hynson, 423 North Charles street, Baltimore, and of the West Virginia, H. F. Pfost, Jackson.

Capsule Filler.

(B. S. T.) William E. Scarlett, 1213 Filbert street, Philadelphia, makes an apparatus specially designed for this purpose, as also, we believe, do Parke, Davis & Co., of Detroit.

Splendid Show Bottle Color.

A. Rosenwald, Chicago, sends for the benefit of his colleagues the formula of a combination, which he styles "Chromo-nitro-muriaticum," claiming it gives a splendid magenta color for show bottles. This is it:

Chromic acid	1 dram
Commercial muriatic acid,	
Nitric acid, of each	2 ounces
Water, sufficient to make 2 or 3 gallons.	

Chlor-Anodyne.

(S. L. B.) Chlor-anodyne is a preparation put up by Messrs. Parke, Davis & Co., of Detroit, who state that each fluid ounce contains:

Morphine hydrochlorate	2⅞ grains
Tincture Indian cannabis	46 minims
Diluted hydrochloric acid	9 minims
Chloroform	46 minims
Oil peppermint	1½ minims
Tincture capsicum	1½ minims

Uses of Formalin.

(B. & S.) If you write to Schering & Glatz, New York, they will be pleased to send you literature concerning the employment of formalin, and if you are specific in your request they can doubtless serve you on the particular point you desire. Formaldehyde, for which formalin is the trade mark name, has come into very great use recently, and you will notice in recent issues of the Era considerable about the article. Suppose you write to Messrs. Eli Lilly & Co., Indianapolis, for what they can send you descriptive of the preparation.

Preserving Grape Juice.

(F. F. R.) The ordinary method of preserving grape juice upon a small scale is by the addition of salicylic acid. This, however, is considered highly injurious, and would bring the product under the ban of the pure food laws in some localities. Some manufacturers of non-alcoholic grape juice claim to use no salicylic acid, or other preservative whatsoever, but we have seen some other specimens upon the market which contained a very appreciable amount of this acid, and others which were preserved by alcohol. We do not think you will be particularly successful in experimenting with grape juice in an extemporaneous way. The method of obtaining a satisfactory product is kept a very valuable trade secret by the manufacturers of this article for the market, and, of course, they do not tell us how they do it. There are very few so-called preservatives which could be added to grape juice in such quantity as would be necessary to preserve this article and yet be unobjectionable as a constituent of the preparation. Grape juice is peculiarly liable to fermentation, and only a large quantity of preventive would be at all successful. We caution against the use of salicylic acid, sulphites, alcohol, etc., and we have yet to hear that a process by heat is successful.

Sozodont.

(G. W. C.) There have been numerous guesses at the composition of this article, but we prefer not to take any responsibility for the correctness of any of them. The manufacturers hold the formula as their secret property, and as they have not told us what it is, of course we cannot accommodate you. Here are some formulas for preparations of the same general type of tooth wash which may be of service to you.

1.—Liquid:

Alcohol	1 fl. ounce
Water	1¼ fl. ounces
Soap	120 grains
Oil of wintergreen	2 drops

Dissolve the soap in the mixture of alcohol and water, add the color, perfume with oil of wintergreen, add enough water to make the fluid measure 3 fluid ounces.

2.—Powder:

Infusorial earth (tripoli)	40 grains
Orris root	125 grains
Precipitated chalk	205 grains

Perfume very lightly with oil of cloves.

Bug Exterminator.

(G. J. D.) We presume you mean by your query "bed bug poison." If we are correct in this surmise you will probably find something to suit you among the following, found in the Era Formulary:

(1)	Corrosive sublimate	¼ pound
	Muriate ammonia, powdered	¼ pound
	Water	½ gallon
	Glycerine	4 ounces
	Wood alcohol	½ gallon
(2)	Camphor	2 ounces
	Spirits of turpentine	4 ounces
	Corrosive sublimate	1 ounce
	Alcohol	16 ounces
(3)	Strong mercurial ointment	1 ounce
	Soft soap	1 ounce
	Oil of turpentine	16 ounces
(4)	Tobacco	100 grams
	Crude naphthalin	100 grams
	Oil melissa, enough.	
	Benzine	1 kilogram

Extract the tobacco by macerating for five days in the benzine; strain and dissolve the other ingredients in the filtrate.

(5)	Tincture of tobacco	200 parts
	Boric acid	6 parts
	Carbolic acid	6 parts
	Salicylic acid	12 parts
	Oil of Indian balm	1 part

Ink Erasers.

(W. J. F.) If the ink has penetrated the paper a mild treatment is generally the most successful if you desire to preserve the texture of the paper; bleaching agents are most generally employed. If the ink merely remains upon the surface of a glazed paper it can be removed without much injury by strong acids, etc.; but the better the ink of course the more difficult it is to remove. We went into this subject quite thoroughly, on page 271, in March 4th Era, and can add little to the information there given. It is often quite important to know what is the character of the ink that has been employed in order that the proper method of treatment for its removal may be adopted. You can probably make a selection from the following processes, copied from the Era Formulary:

(1) Immerse blotting paper or any similar material in a hot concentrated solution of citric acid, roll it into a pencil, and coat the larger portion of it with paper or lacquer. Moisten the eraser with water, and rub over the ink to be removed. Drop upon the ink spot a drop of water containing chloride of lime. The ink immediately disappears.

(2) Mix equal parts of oxalic acid and tartaric acid in powder. When to be used dissolve a little in water. It is poisonous.

(3) Dissolve equal parts cream of tartar and citric acid in water.

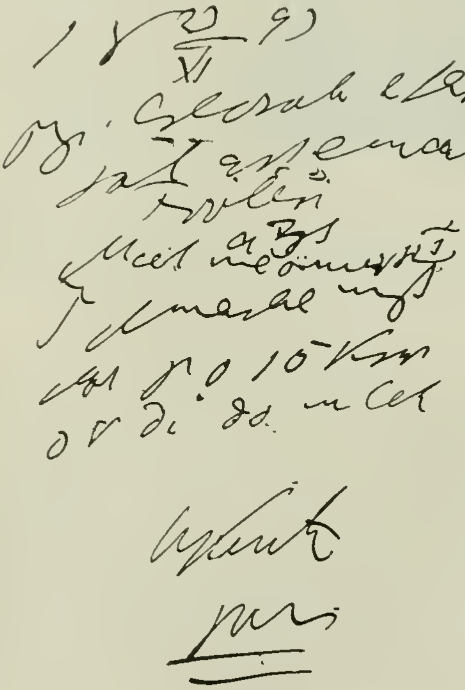
(4) Cold aqueous or acetic acid solution of calcium hypochlorite, bleaching powder, eau de Javelle.

(5) Alum, amber, sulphur, saltpetre, of each, 1 part, in fine powder. Mix. This forms an excellent mixture for the removal of ink spots and writing on paper.

(6) In 2 quarts of water dissolve 4 ounces of citric acid, and then add from 6 to 8 ounces of a concentrated solution of borax. This is solution No. 1. To prepare solution No. 2, add 2 quarts of water to ¾ pound of chloride of lime, shake well and set aside for about a week; decant, and add from 6 to 8 ounces of concentrated solution of borax. This composition is used by saturating the ink spot with solution No. 1, removing excess of liquid with a blotter, and then applying solution No. 2. When the stain has disappeared, apply the blotter, and wash the spot by the alternate use of clear water and blotting paper.

Polish Prescription for Translation.

Pharmacist, J. M. Kranz, of Brooklyn, wishes his brother druggists to help him out in the translation of the following prescription:



Lotion for Perspiring Feet.

(J. Y. C.) Remedies usually recommended for treatment of perspiring feet are applied in powder form, and generally contain alum, borax, etc. The Era Formulary gives these formulas:

(1)	Talc	10 parts
	Alum	2 parts

Largely used in Swiss Army, preferable to chromic acid, and applicable even for sore feet.

(2) Naphthalin in scales is simply strewn into the stockings or shoes.

(3)	Oleate of zinc, powdered	1 ounce
	Boric acid, powdered	2 ounces
	French chalk, powdered	3 ounces

(4) A powder composed of salicylic acid, soap, talc and starch. The powder renders the feet firm, induces an agreeable softness, and removes all unpleasant odor, its action being to prevent the formation of butyric, valerianic, and other acids of the same family, which injure the feet.

The Standard Formulary is authority for these:

(5)	Salicylic acid	105 grains
	Boric acid, fine powder	350 grains
	Talcum, fine powder	7 av. ounces
(6)	Mercuric chloride	1 grain
	Sodium salicylate	1 av. ounce
	Prepared chalk	1 av. ounce

Dust a little of the powder in the socks every morning.

To Clean Gloves.

(E. W. C.) Take your choice from the following, found in the Era formulary:

(1) Take fine curd soap, one pound, scrape it into a fine powder, put it into a jar and pour upon it from time to time sufficient strong alcohol to make it into a thick jelly; add one teaspoonful of ether or one half teaspoonful liquor potassa, mix and put into bottles well corked. To use, put the gloves on the hand, rub on the preparation with a piece of flannel, when the dirt will disappear.

(2)	Strong solution ammonia	½ ounce
	Solution chlorinated soda	8 ounces
	Distilled water	9 ounces
	Yellow soap in fine shreds	12 ounces

Make into a paste, and apply with a clean piece of flannel.

(3)	White soap	4½ drams
	Hot water	2½ drams
	Rub into a paste and add	
	Solution of chlorinated soda	2½ drams
	Water of ammonia	20 minims
(4)	Javelle water	8½ fl. ounces
	Water of ammonia	½ fl. ounce
	Powdered castile soap	12½ ounces
	Water	9½ fl. ounces

Stand until a jelly forms, then use with a piece of flannel.

(5) Pipe clay, colored with yellow ochre, umber or Irish slate, quantity sufficient, and afterward scented with a little powdered orris root, or cloves. Used to clean gloves made of doeskin and similar leather.

Ice Cream for Soda Water.

(E. C. S.) In addition to the formulas published on page 513 of our issue of April 29, we gather a few from the pages of the Spatula, as follows:

(1)	Sweet cream	4 quarts
	Sweet milk	2 quarts
	Granulated sugar	4 pounds

Dissolve sugar in the cream and milk, strain into a 12-quart freezing can, run freezer very slowly for ten to twelve minutes, then run very fast until batch is frozen to suit. Never flavor, if ice cream is to be used at fountain, otherwise flavor with one ounce of best extract. Always use the best; you will find that it pays. You will notice that neither eggs nor gelatin are used in this recipe. A batch carefully prepared and as carefully frozen will always be good.

(2)	Pure cream	6 quarts
	Eggs	6
	Sugar	1½ pounds
	Vanilla	¾ ounce
	Milk	1 pint

Beat the eggs thoroughly and add the milk; in this dissolve the sugar. Pour into freezer and add the cream, of best quality, to get good results. Stir until well mixed, then pack the freezer. When about half frozen the vanilla should be added. In order to obtain the finest result in a cream, after the the paddles have been removed from the freezer the cream should be whipped thoroughly with a wooden paddle kept for that purpose. This makes the cream nice and light. One of the greatest mistakes made, as a general thing, in the making of ice cream, is that of cooking the cream. It should be avoided. Cream should always be kept in porcelain and never in tin.

(3)	Rich, sweet milk	2 gallons
	Eggs	10
	Corn starch (the best)	4 tablespoonfuls
	Granulated sugar	4 pounds

Mix the eggs and sugar thoroughly and add to the milk cold, then apply heat to the whole until the milk begins to simmer just enough to cook the eggs; then cool and freeze.

(4)	Good cream	2 gallons
	Milk	½ gallon
	Granulated sugar	5 pounds
	Best vanilla	2 ounces
	Eggs, whites of	1 dozen
	Gelatin (shred)	3 ounces

Dissolve the gelatin in the milk by the aid of heat, and be careful not to scorch it. Mix the milk and cream, and dissolve the sugar in it by stirring. The cream should not be ice cold or it may lump the gelatin. Strain into the freezer and commence freezing at once, turning very slowly. It is best not to pack the freezer any higher than the cream, as the frost will collect on the inside of the can and may cause small particles of ice to get in the cream. As soon as the cream commences to get stiff, add the whites of the eggs, well beaten, and the vanilla. The freezer should then be turned very fast until the cream is as stiff as wanted.

(5)	Cream	3 quarts
	Milk (not skimmed)	3 quarts
	Eggs	1½ dozen
	Granulated sugar	2 pounds
	Essence lemon	1½ ounces
	or	
	Extract vanilla	1 ounce

Dissolve the sugar in milk and cream and add the beaten eggs and flavoring. Mix well and freeze.

Percentage Solutions in Prescriptions.

(Prescriber) A couple of years ago we went into this question very thoroughly in one of the papers in our Study of Pharmacy series. We reprint here a portion of the paper which bears directly upon the percentage question, and you will note that it covers the ground fully to your satisfaction:

Percentage means for each 100, hence a 4 per cent. solution of any substance would contain in every 100 grains of the solution 4 grains of the substance and 96 grains of the solvent. Demonstration:

A fluid ounce of distilled water at normal temperature weighs 456.392 grains, so that 4 per cent. of 1 fluid ounce would be as the proportion $100 : 4 : : 456.392 : x = 18.25568$. Subtracting 18.25568 grains from 456.392, or the weight of a fluid ounce of water, gives 438.13632 grains of water in which to dissolve 18.25568 grains of substance to obtain a solution weighing 456.392 grains. In this calculation it is assumed that 1 grain of the solution occupies the same volume as 1 minim of the water. This is not really the case, so that a 4 per cent. solution measures a little less than 1 fluid ounce. If it be desired to dispense exactly 1 fluid ounce of the solution, the only practical way is to prepare a little more than is wanted and throw away the surplus. Wilder gets the same thing and simplifies the calculation by taking the nearest convenient round number to the weight of the required quantity, dissolves in it the requisite number of grains of the salt, and, after filtration, measures off the required quantity, throwing away the excess. In order to make a fluid ounce of 4 per cent. solution of a salt in water, he takes the nearest convenient round number, which is 500 (a fluid ounce of water weighing 456.392 grains), and dissolves 5 times 4 grains of salt in 500 less

20 grains of water, and, after filtration, measures off 1 fluid ounce. Another method is the following: Let A represent the weight of the solvent, be it grains, grams or pounds; B the desired percentage strength of the solution to be made, and C the number of grains of salt required to be added to A. We now have the formula

$$\frac{A \times B}{100 - B} = C$$

The total number of grains, grams or pounds representing the weight of the finished solution must be A + C. Suppose we wish to make a 4 per cent. solution of cocaine with a fluid ounce of water as the solvent. How much cocaine will be necessary? Four per cent. denotes $^{4}/_{100}$ of the weight of the finished solution, and hence the weight of the water must represent $1 - {}^{4}/_{100}$ or $^{96}/_{100}$ of it; $^{96}/_{100}$ of the solution (water) is 456.392 grains. If 456.392 is $^{96}/_{100}$ of some number, $^{1}/_{100}$ of that number must be $^{1}/_{96}$ of 456.392, or 4.754. If 4.754 be $^{1}/_{100}$ (or 1 per cent.), $^{4}/_{100}$ (4 per cent.) will be 4.754 × 4, or 19.0163 grains.

Another method of arriving at the same result is by proportion: Let 1 represent the weight of the desired solution, 4 per cent., or $^{4}/_{100}$ of which is cocaine. Then $1 - 0.04 = 0.96$. We already know that 456.392 grains is 96 per cent. If 96 per cent. of some number is 456.392, how much is 4 per cent.? By proportion we get the following statement:

$$0.96 : 0.04 :: 456.392 : x$$
$$x = 19.0163$$

Now let us see if we can prove our demonstration. The solution when completed must weigh (456.392 + 19.0163) 475.408 grains.

$$475.408 \times 0.04 = 19.016 \text{ grains (cocaine)}$$
$$475.408 \times 0.96 = 456.392 \text{ grains (water)}$$
$$456.392 + 19.016 = 475.408$$

Ant Exterminator.

(W. H. S.) Try one of the following:

(1) Powdered borax sprinkled around the infested places will drive them away, as also will powdered cloves. Grease a plate with lard, they will leave sugar to go to it, and then turn them into the fire; cracked nuts will answer the same purpose. Oil of turpentine run into the cracks with a sewing machine oil can.

(2) A good preventive for the inroads of ants is a stripe of carbolated petrolatum about half an inch in width drawn about the places frequented.

(3)

Cape aloes	1 pound
Water	1 gallon

Boil together, and add to the mixture:

Camphor, in small pieces	6 ounces

This can be used for other insects by diluting with water and sprinkling through a garden pump or watering can.

(4) Sprinkle their haunts with quick-lime containing a twentieth of its weight of powdered camphor.

Bird Lime.

(C. S. B.) Bird lime is a thick, soft, tough and sticky mass of a greenish color, has an unpleasant smell and bitter taste, melts easily on heating, and hardens when exposed in thin layers to the air. It is difficult to dissolve in alcohol, but easily soluble in hot alcohol, oil of turpentine, fat oils, and also somewhat in vinegar. The Techno-Chemical Recipe Book states that the best quality is prepared from the inner green bark of the holly (Ilex aquifolium), which is boiled, then put in barrels, and submitted for fourteen days to slight fermentation until it becomes sticky. Another process of preparing it is to mix the boiled bark with juice of mistletoe berries and burying it in the ground until fermented. The bark is then pulverized, boiled and washed. Artificial bird lime is prepared by boiling and then igniting linseed oil, or boiling printing varnish until it is very tough and sticky. It is also prepared by dissolving cabinetmakers' glue in water and adding a concentrated solution of chloride of zinc. The mixture is very sticky, does not dry on exposure to the air, and has the advantage that it can be easily washed off the feathers of the birds.

Gun Grease.

(J. L., M. D.) wants a formula for the gun grease used for the inside and outside of rifles of the Winchester, Marlin and Savage types, also the formula for the oil used in the action of these rifles, and which is sometimes called the "One in Three Oil." We have made a very laborious search and extended inquiry without results. Perhaps some reader can help him out.

What is Naphtha?

"Oleum" wishes to know what should be dispensed over the counter when naphtha is called for. Give the customer petroleum benzine, which is fully described in the United States Pharmacopœia.

I. Neustaedter.

——Isidore Neustaedter, whose portrait is given above, was the winner of the first prize, a copper still, offered by the Alumni Association of the New York College of Pharmacy to the Junior Class of 1897. Mr. Neustaedter was born in a small city in Austria where he attended school up to the age of 12 years. At that period his parents came to the United States and settled in New York City. Soon after his arrival here he entered a primary school where he remained for one year and was then promoted to the grammar department from which he graduated with honors after four years of diligent application. He then continued his studies in the City College with a view of acquiring a knowledge of mathematics and Latin necessary for a pharmaceutical course. While thus engaged his leisure time was taken up in gaining a practical knowledge of pharmacy in the drug store of his brother. In 1895 he entered the employ of F. Kahlenberg, who, in the fall of 1896 gave him the privilege of entering the New York College of Pharmacy.

Isidore Neustaedter.

Conrad Berk Lee.

Norristown, Pa., May 9.—Conrad Berk Lee, of the J. Ellwood Lee Company, in Conshohocken, died yesterday at his home in that borough of typhoid fever. The deceased, a son of Bradford and Sara A. Lee, deceased, was born in Conshohocken and always made that borough his home. After completing his education in the public schools he entered the employ of J. Wood Brothers & Co. In 1884 he associated himself with his brother, J. Ellwood Lee, in the manufacture of surgical instruments and became Assistant General Manager for the concern, traveling extensively in Europe and this country in the interests of the company. Mr. Lee was a member of the Penn Club, of Conshohocken; the Manufacturers' Club, of Philadelphia; the Roxborough Country Club and a number of fraternal societies. He was a vestryman of Calvary Protestant Episcopal Church. The deceased was 35 years of age and is survived by his wife, formerly Miss Anna Hendron, of Bridgeport.

——Sergeant E. J. Sultan, Hospital Steward of the 69th Regiment, who runs a drug store at Twenty-third street and Third avenue, complains of an item in last week's Era. The item represented Mr. Sultan as having incurred a reproof from Col. George M. Smith for bringing sandwiches and other refreshment for Capt. Duffy's men in a tricycle arrangement labeled "Ambulance Corps." The item contained some inaccuracies. Mr. Sultan did not propel the machine himself and it did not figure in the procession, but there is a pretty disagreement on between the colonel and his subordinates about the affair just the same.

Henry Kraemer.

Clement B. Lowe.

Henry Kraemer, who is to occupy the Chair of Botany and Microscopy of the Philadelphia College of Pharmacy, was born in Philadelphia, July 22, 1868, and graduated from Girard College in 1883. In 1884 he was apprenticed to Dr. Lowe, and five years later graduated from the Philadelphia College of Pharmacy. It was his original intention to take up the study of medicine, but the receipt of the Maisch microscope prize and the Henry C. Lea prize of $100 for his thesis upon "Microscopical and Chemical Study of White Oak Bark" caused him to lean toward pharmacy. For a short period he was assistant to Professor S. P. Sadtler, and in 1890 was called to the College of Pharmacy of the City of New York as instructor in pharmacognosy, in which position he remained two years. While in New York he completed a course of study in the School of Mines of Columbia College, and in April, 1895 accepted the Chair of Botany, Pharmacognosy and Materia Medica of the School of Pharmacy of the Northwestern University, with the privilege of spending a year abroad. This year was spent in special work at the University of Marburg, from which he received the degree of Doctor of Philosophy. From 1892 to 1895 he was Reporter on the Progress of Pharmacy for the American Pharmaceutical Association.

Clement B. Lowe, who has recently been called to the chair of Materia Medica and Physiology of the Philadelphia College of Pharmacy, is the son of a Baptist minister, and was born in Salem, N. J., in 1846. After attendance at the schools of Salem the young man entered Bucknell University, at Lewisburg, from which he graduated in 1865 with the degree of Bachelor of Philosophy. He then entered the Philadelphia Polytechnic College, but relinquished his course on account of ill-health, and in 1867 purchased the drug store at Ninth and Vine streets, which he conducted until about two years ago. In 1882 he entered the Philadelphia College of Pharmacy, graduating in 1884, and receiving the appointment of assistant to Professor Maisch in 1887. Upon the election of Professor Bastin to succeed Professor Maisch, Mr. Lowe was appointed assistant to the former, and also elected instructor in materia medica and botany. Mr. Lowe is also a graduate in medicine, receiving his diploma from the Jefferson Medical College of Philadelphia, and has been a prominent member and officer of the alumni association of the College of Pharmacy.

——About eighty Cleveland, O., druggists have combined to resist suits brought by a Chicago patent medicine firm to enforce payment for $25-lots of medicine which were shipped to the defendants. The claim is resisted because the goods were purchased under the understanding that the business of the purchasers was to be extensively advertised throughout the city and because each firm was assured that it would be given the exclusive agency for the goods.

New Jersey Pharmaceutical Association.

The twenty-seventh annual meeting of the New Jersey Pharmaceutical Association was held this year in the lair of the "Tiger"—historic Princeton, with its famous university, old with its memories of the great men who have come therefrom, young with the life and "go" of the undergraduate. There was fitness in this meeting at this place. The association is the oldest in the United States, but in activity it ranks with the younger ones.

The local committee began the occasion with a reception to the officers and ladies at the Princeton Inn on Tuesday evening, May 4, giving the visitors an opportunity to renew old acquaintances, make new ones and incidentally to listen to some music in which the undergraduate figured.

The first business session was held Wednesday morning in the Assembly Room of the Inn. Dr. Patton, president of the University welcomed the visitors on behalf of the University, and ex-Mayor Anderson performed a similar service upon the part of the town. President Ryerson returned the thanks of the association, and delivered his annual address. Reference was made to the settlement of the doubt as to the legality of the Pharmacy Board appointed by Governor Griggs. It was recommended that provision be made in the by-laws for dropping members in arrears for two years, and a suggestion was made that the Committee on Queries might be aided in their work by the institution of a "Question Box." With reference to the work of the Pharmacy Board the president deprecated some criticism that had been directed against it, and stated that the object of pharmacy laws was primarily in the interest of the public and only incidentally in the interests of pharmacists as a class. He was opposed to too great extension of the standards of examination to compel applicants for registration to be expert analysts, microscopists and botanists. This requirement tended to make "walking quiz compends," while the true aim of the board should be to ascertain how much the candidate knew of the practical necessities. The question of substitution was brought up in a way which meted condemnation to manufacturing houses which tried to make physicians believe that theirs were the only strictly reliable goods, and those others which proclaimed "Don't you dare to give any other make than our's, or we will publish you to the world as a dishonest and dangerous druggist."

The reports of the secretary and treasurer showed quite favorably, that of the latter showing a balance on hand of $1,085. The report of the State Board of Pharmacy referred to the favorable settlement of the question of the legality of the board's appointment.

At the afternoon session papers were read by A. Drescher on "A Chemical and Physiological Examination of the Common Blue Weed, Echium Vulgare"; by W. C. Alpers on "The Relations of Boards of Pharmacy to the State Associations"; by Charles Wuensch on "The Home Laboratory Corporation of Newark." A banquet held in the evening was a very enjoyable affair, W. C. Alfers acting as toast master. E. A. Sayre responded to "Historic Princeton", H. P. Reynolds to "Antique Princeton". Albert Bruen to "The Relation of the Wholesaler and Retailer", Prof. J. P. Remington to "The A. Ph. A.," and W. M. Davis to "The Ladies." The closing session was held on Thursday, May 6, and after disposing of routine business, voting thanks, etc., Summit was chosen as the place for next year's meeting, and the following officers were elected:

President, E. H. Sayre; first vice president, G. H. Whipple; second vice president, C. R. Priest; treasurer, J. C. Field; secretary, G. T. Fitzgeorge; Executive Committee, G. H. Whipple, H. O. Ryerson, F. B. Kilmer, W. P. Rich and J. W. Merritt.

——Ex-Health Officer Dr. J. W. Prendergast and O. Z. Limerick appeared before Judge Murphy at Cincinnati, O., on Friday morning, April 30, and entered a plea of not guilty to the indictment recently made by the grand jury charging them with attempted blackmail of the Fraser Tablet Triturate Mfg. Co., of New York.

——Three young men entered a drug store at Markle, Ind., and while the clerk had his back turned played a joke on him by abstracting a bottle labeled "Alcohol," but which in reality contained poison. They went outside and drank the contents with the result that two of them died in a short time, and at last reports the third was in a hopeless condition.

——James D. Paine, of Rochester, N. Y., was defendant recently in a suit for slander, with damages placed at $5,000. The suit was brought by a colored waiter at the Powers Hotel, who based his complaint upon the fact that Mr. Paine had referred to him as a rascal and that he was dishonest and not to be trusted. The case was dismissed by the justice before whom it was brought without hearing evidence or submitting it to a jury.

THE PHARMACEUTICAL ERA

[*WEEKLY.*]

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TRADE DEPARTMENT, Including Trade Reports, Market Reports, Trade Notes, Druggists' Advertising, Pharmacy in Australasia, Prices Current, etc., in pages immediately following Reading Pages.

Bound Volumes.

Our subscribers do not need to be reminded of the desirability of preserving their copies and keeping their files of The Era complete. We reserve of each issue a limited number of copies to supply orders from subscribers who have neglected to keep their files complete. Our supply of these back numbers is becoming rapidly depleted, and old subscribers are particularly requested to let us know soon of any back numbers which they may require for completing their files. With each successive year the value of a complete file of Eras is sure to be enhanced.

We can supply back numbers in bound volumes (Full Cloth) at the following prices, which include express charges, to any point within the United States. Foreign orders f. o. b. New York.

Vol. I., 1887	$3.00	Vol. IX., Jan.-June, 1893	$2.50
Vol. II., 1888	3.00	Vol. X., July-Dec., 1893	2.50
Vol. III., 1889	3.00	Vol. XI., Jan.-June, 1894	2.50
Vol. IV., 1890	3.00	Vol. XII., July-Dec., 1894	2.50
Vol. V., Jan.-June, 1891	2.50	Vol. XIII., Jan.-June, 1895.	2.50
Vol. VI., July-Dec., 1891	2.50	Vol. XIV., July-Dec., 1895.	2.50
Vol. VII., Jan.-June, 1892.	2.50	Vol. XV., Jan.-June, 1896	2.50
Vol. VIII., July-Dec., 1892	2.50	Vol. XVI., July-Dec., 1896.	2.50

For the convenience of subscribers who preserve their copies of The Era, we furnish a useful binder which will hold the copies for six months (1 Vol.), with the advertisements, or the text pages only, for an entire year.

The "Era Binder," 75 cents per copy, post paid. To foreign countries, $1.00.

THE RED FLAG.

The following article, which is taken from a recent issue of The National Advertiser, a publication issued in the interests of advertisers, will no doubt prove of special interest to druggists:

DOWN WITH SUBSTITUTION.

Publishers and Large Advertisers Are Fast Coming Into Line.—How the War Spreads.

Every day brings fresh proof of the favor which The National Advertiser's plan for fighting substitution finds among advertisers and publishers. These notices, which are to be scattered through the news articles of every issue of papers, and new copy supplied every month, meet the approval of a growing list of papers:

> Do you get what you want when you ask for goods advertised in this newspaper? The publisher would be glad to hear of any case where substitution has been practiced or attempted.
>
> An honest storekeeper will not try to convince buyers that he knows what they need better than they do.
>
> Standard, reputable articles are not dear at the prices asked for them. Substitutes offered by unscrupulous and irresponsible makers are costly at any figure. Be sure that no humbug is practiced on you when you go to buy.
>
> Say "No," and stick to it when you are urged to buy something "just as good" as the article you asked for. Please notify this office if any storekeeper or clerks in town try to palm off a substitute on you.
>
> Examine the labels and trademarks of proprietary articles. Imitations are common, and in some cases the difference between them and the genuine is so slight as to escape careless observation. Beware of dishonest shopkeepers and salesmen.
>
> The retail dealer who advertises, "We always give just what you ask for," and lives up to his promise, is certain of a good trade.
>
> "False in one, false in all," is an ancient legal maxim. Remember it to the disadvantage of any tradesman who tries to substitute one article for another.
>
> When you buy a proprietary article, look at it before the salesman wraps it up, and assure yourself that you are getting the right thing. Substitution is rampant.
>
> The publisher of this newspaper will be glad to learn of any case where an attempt is made to give a customer a substitute for some proprietary article of established reputation.
>
> No honest dealer will try to sell what he knows the customer did not order and does not want. Substitution thrives for a time, but in the long run it goes to the wall.

A list of papers printing the notices will be kept standing in The National Advertiser, with a statement of the number of notices printed, etc. Publishers using the list, wholly or in part, are requested to send notice of the fact to this office, and to put The National Advertiser on their mail lists. It is understood by the advertisers who cooperate with us and whose names are given below, that papers using the notices reproduced in this article are not expected to publish similar matter in the interest of individual firms.

Next week The National Advertiser will publish a batch of letters from newspapers commending its plan of campaign against substitution. Large advertisers, who complain that they lose half their sales through substitution, will see the desirability of patronizing papers that protect them, rather than those which do not. It is clearly understood by advertisers and publishers that no one line of storekeepers is singled out for attack. For instance, The National Advertiser does not especially and pointedly assail the druggists. The very fact that medicine advertisers feel compelled to include in their advertising announcements a warning against substituters, is in itself an indirect reflection on the druggists, although no individual class of dealers is specified.

The anti-substitution notices in The National Advertiser will be changed every month. There is good reason to believe that within a month 1,000 papers will be in line. The following large advertisers have expressed their cordial approval of The National Advertiser's plan:

James Pyle & Sons. Warner's Safe Cure Co., J. C. Ayer Co., The Charles E. Hires Co., T. A. Slocum Co., The N. K. Fairbank Co., W. T. Hanson Co., A. C. Meyer & Co., The Piso Co., Mme. A. Ruppert, Postum Cereal Co., Pond's Extract Co., Londonderry Lithia Co., F. T. Hopkins, Kickapoo Medicine Co., J. W. Wuppermann, Swift Specific Co., Lydia E. Pinkham Medicine Co., W. Sharpe Kilmer, Radway & Co., John H. Woodbury, Loring & Co., and others.

This method of attacking the drug trade through the daily papers was started several years ago by a prominent advertising agent of New York, who thought, no doubt, he would render his clients, the advertisers and the daily press, a distinguished service. His efforts met with considerable opposition on the part of a number of leading proprietors, but, nevertheless, he created a sensation. It seemed to us at the time, and we still maintain that opinion, that any schoolboy ten years old should have seen that this action would be interpreted by the druggists like the flaunting of a red flag in a bull's face.

We wonder how long it will be before these proprietors and newspaper men will discover that it is one thing to lead a horse to a trough, but quite another thing to make him drink. They seem to act upon the principle that because they send a customer to a drug store, the druggist is bound, by all that he should consider sacred in business, to supply just exactly what that customer asks for. They seem to forget, these newspaper and medicine men, that these proprietors are not maintaining the retail drug establishment at their own expense, that it is the druggist's place of business, and that he has a right to sell whatever he pleases. They seem to forget also that the druggist has never asked the proprietor to send these customers to his store, and some of the druggists even go so far as to ask by what right the proprietor sends them these customers, and by what further right does he insist upon the druggist selling these goods if he does not want to sell them.

Of course the druggists are stimulated by financial interests, the same as the proprietor. All this talk about these medicines being prepared from reliable and tried formulas by scientific manipulators, is mere buncombe. Every druggist who is able to pass a Board of Pharmacy examination knows how to make this class of preparations, and as to the value of his advice to the patient, if the druggist is inclined to give such advice, it will compare favorably with the shotgun professional advice which the patient may have received from the advertisement in the daily papers.

Just so long as these proprietors keep flaunting this red flag before the drug trade, just so long will they keep antagonizing the druggists against proprietary medicines.

Ever since this newspaper agitation against substitution was commenced, the patent medicine business has been on the decline, and so long as it continues just so long the opposition will be encouraged. You cannot catch this kind of flies with vinegar, and if these proprietors want the assistance of the drug trade in the distribution of their goods, they must show the druggists that they are their friends, that they are desirous of assisting the druggists all they can in maintaining their prices, and that they will treat these dealers with the consideration due to customers and distributing agents, who are not *obliged* to buy their goods, but who are willing to do so if they can sell them at a profit.

Queer Excise Abuse in Massachusetts.

Certain druggists in Massachusetts have been having a hard time of it under the excise law. According to this law the druggist must get a certificate of recommendation from the State Board of Registration in Pharmacy and present it with his application for a sixth grade license to the board of aldermen or selectmen of his city or town. It lies with them to grant or withold the license, but the certificate of recommendation is an essential prerequisite. Massachusetts town politicians have to trim their sails very nicely to avoid collision with the prejudices of the church element on one side and the passions of the roysterers on the other. By refusing to issue licenses they please the former. Then by conniving at the unlicensed sale of liquors they make themselves solid with the other element. It is said that a reputable drug firm to whom a license was refused on the ground that theirs was a no-license town, received the private assurances of the authorities that they might sell for medicinal purposes without fear of annoyance. Some ambitious selectman, however, afterward made up his mind to prove his zeal for temperance by sacrificing the druggists. There was no other course for them but to pay their fine and say nothing.

Now, the question arises whether the Board of Registration in Pharmacy can recommend for license a firm recently convicted of violating the excise law. An application has been made by the firm in question and the circumstances have been fully explained. It is believed that the board will grant the recommendation in this and a number of similar cases. After all, the only safe rule in Massachusetts is not to sell liquor at all without the dollar license.

The Era Course in Pharmacy.

It is exceedingly gratifying to note the many inquiries which come to us for information regarding "The Era Course in Pharmacy," first announced in the issue of April 29. It shows a widespread interest in a plan which has for its purpose the presentation of educational advantages to those who are at present debarred from them, and refutes the occasional suggestion that those who are without extended pharmaceutical education do not care for it anyway. To those who are impatient for details we will say that these are being arranged as speedily as possible; if there is any seeming delay it is one which tends to greater effectiveness in the practical working of the plan.

As to the appropriateness of this course in pharmacy, both in its scope and time, this can be no better emphasized than by the following extract from the prospectus now in course of preparation:

"There never was a time when it required so much study and educational preparation to become and remain a first-class pharmacist as at present. Never before was so much demanded from the dispensing druggist, and never has the struggle for existence and subsistence been as keen and fierce as it is to-day.

"There was a period when the druggist's apprentice, by careful attention to the routine duties of the shop, might hope to acquire as ample knowledge of the theory and art of pharmacy as that possessed by his fellows, but changes in the practice of medicine and the progress of scientific discovery have rendered such a means of education in pharmacy entirely inadequate. The character of the substances now handled by druggists differs so greatly from those of a quarter of a century ago, while their number has increased so enormously, that only a thorough and exhaustive course of study, added to the practical training of the shop, can give the educational equipment necessary to the achievement of success in these crowded times of competition.

"This course of study, to accomplish its object, must be carefully graded, it must be systematically pursued, it must be properly directed, and in order to reach the class who will be most benefited by it, must be comparatively inexpensive. This is the character of the instruction which The Era Course in Pharmacy aims to supply."

Commissioner Lyman Backs Down.

As announced in our news columns this week, New York State Excise Commissioner Lyman will permit druggists in prohibition towns to manufacture and sell medicinal preparations and fill physicians' prescriptions, containing alcohol or alcoholic liquors as a component part. The point is that under the Raines law no excise license can be issued in local option towns, and hence the Commissioner really decides that alcohol or alcoholic liquors may be dispensed as part of a medicine by a druggist, without a license. He says:

"In my opinion, the compounding and sale of a physician's prescription by a pharmacist, of which liquor is a component part, is not 'trafficking in liquor,' within the meaning of the Liquor Tax law. Such a prescription is a remedy to be administered or taken, and not 'liquor' as defined by law and neither within the language of the act, or the mischief it intended to remedy."

These are welcome words to the bullied and badgered possessors of U. S. internal revenue licenses whom Mr. Lyman's agents have tried to coerce into taking out State licenses under threat of prosecution. They indicate that the Commissioner has seen a great light and that hereafter the path of the pharmacist will be less rough. The joy felt by the average druggist in this announcement, however, will be tempered by the additional information obtained by our reporters from trustworthy sources that it was chiefly to satisfy the demands of the great cut-rate pharmacies and department stores that this change of front was made, and that as a matter of fact the New York Pharmacy law, which was intended to prevent the competition of just such establishments, has been construed in their favor by the compliant State Excise Department. The almost defunct New York Board of Pharmacy ought to spend the few remaining months of its official career in trying to enforce the law requiring proprietors of drug stores to be licensed pharmacists.

Organization.

"It is only by organization that wrongs are righted or justice obtained," said the outgoing president of the Kings County Pharmaceutical Society at the last meeting. His remarks on this theme deserve careful attention on the part of retail druggists everywhere. It has passed into a proverb that no organization of retail druggists can long survive, but the Kings County Society has survived for twenty years and was never so prosperous as now. On the other hand, as an illustration of the rapidity with which a timely organization can be effected, a member of the Kings County Society, at the same meeting, reported the organization within a very few months of a League for Shorter Hours for Druggists which already numbered over 300 members.

The world is moving on. One reason retail druggists have found it difficult to maintain organizations of their own has been due to this very evil of long hours rendering it no light duty for members to attend meetings. Some time this side of Utopia druggists will have fewer hours of labor, and then it will be found that they are no less social, generous, and open to reason than other classes of business and professional men. On the contrary, while there are a few conspicuous exceptions to the rule, pharmacists in this country are admitted to be generally the most intelligent and companionable men in our various communities, and such pharmaceutical organizations as have had any real cause for existence have almost invariably prospered. But before the consummation of the hopes of the shorter-hours agitators is reached, there will be many trade evils to be suppressed, many legislative tyrannies to be resisted, many readjustments of present trade relations to be effected, which can only be accomplished by organization. Therefore note the remarks from the address mentioned.

"A compact organization of professional men have the power at any time to impress upon legislative bodies or municipal institutions their needs and desires. Individual effort, no matter how well sustained, can never hope to accomplish thoroughly satisfactory results. It is only by organization, in this world, that wrongs are righted or justice obtained."

Correspondence.

We are pleased to publish here communications from our readers on topics of interest to the drug trade. Writers are requested to express their views as briefly as possible. Each article must be signed by its writer, but his name will not be published if so requested.

A Defender of the U. T. A.

Windsor, Ont., May 14, 1897.

To the Editor: Your severe criticism of the U. T. A. has drawn considerable attention to that association, and since the English have adopted a system of numbering goods under the P. A. T. A. plan it has attracted considerable notice to the U. T. A. plan.

A communication has been started by the secretary of the Ontario Society of Retail Druggists, J. T. Pepper, secretary and treasurer, who has, I understand, been up to the Detroit office of the U. T. A. and made an investigation of its affairs, which has been so satisfactory that he purposes enlisting the Canadian druggists under this plan. If this is the case, and I am assured it is, it will place you in a very bad light among the retailers of the United States, as Mr. Pepper is a thorough man of business and organizer.

You might make inquiries if this is the case, as you must have means of confirming matters of this kind. The U. T. A. seems to have stood a good deal of fire, and when England and France are taking up a similar system, the days of the proprietors of patents doing business with cutters will, soon be at an end.

Your articles seem to myself and many others, to have animosity and jealousy in their make up, and there is no doubt but what the management of the U. T. A. see and have proof of this in their canvass, as one store that I happened to be in with one of their agents became members of the U. T. A. after being shown your article, which proved that the association must be aggressive to cause so much attention being called to it by a rival journal. Some manufacturers are envious of an honest plan and it looks as though you were implicated. Yours truly,

J. W. NASH.

[The signer of the above writes on the stationery of a Canadian hotel. He should give his address so we may know who he is. The Mr. J. T. Pepper whom he mentions is a druggist at Woodstock, who has recently been elected general manager of the U. T. A. To say nothing of the Utopian scheme of the U. T. A., the financial methods of its chief promoter have been of such a peculiar nature and have been so widely exposed that there is little fear that any wide-awake druggists will longer be found to contribute monetary support to the scheme.—Ed.]

POPULAR AND SCIENTIFIC NAMES FOR SPECIFIC SUBSTANCES do not invariably denote the same thing exactly, the former being frequently somewhat wider in their scope, and some letters that have appeared in the Lancet show that this is peculiarly the case with regard to certain of the internal organs of animals. (Pharm. Jour.) One writer, desiring to give thymus gland to a patient who was the subject of exophthalmic goitre, went to a slaughter house in order to assure himself that he would get exactly what he ordered. When he mentioned "sweetbread" the butcher said there were three in the calf—the throat, heart and stomach sweetbreads, being the thyroid, thymus and pancreas, respectively—and that the heart sweetbread was very small in the bullock. This confusion of totally different organs under the same general term is far from rare, and medical men or pharmacists who have occasion to procure particular glands, etc., usually find it desirable to be present when they are being removed. Butchers are gradually becoming educated with regard to the position of the thyroid, but as yet there are probably few who could be depended upon, unaided, to localize the suprarenal capsules.

(For the Era.)

A RIP VAN WINKLE EPISODE.

By HARRY B. MASON.

I waked from what seemed to me a long and restful night's sleep. I lay quiet for a while, thoroughly enjoying the delicious content afforded by spending waking moments under warm coverlets. I did not for a time notice that the room had undergone changes since I had retired to bed, and when I did, I dispelled them as visions of the waking period. But succeeding clearer moments established them true beyond doubt. The paper was new, the ceiling was frescoed, and the furniture was more elegant than before. "By Jove!" soliloquized I, "the pater must have struck it rich. But how the dickens has all this been effected during my sleep." Quite by chance my eyes found the calendar, and I was at first astounded to find the year given as 1917! But astonishment soon gave way to unconcern as I thought of the hero of "Looking Backward," which I had some time ago been deeply interested in reading. The more I thought of this the more disturbed I was that I had slept but twenty years. Bellamy's hero, you remember, slept something like 133. I presume the difference was due to the manner in which sleep was induced. No Svengali had ushered me into the peace of oblivion. My last remembrance had been of reading Mr. Lloyd's Etidorhpa. (And now that I thought of it, this was at the store, too. I must have been carted to the house, and allowed to sleep my sleep out, which quite broke my former records.) The complete arrest of bodily function and tissue waste which the central figure of that remarkable science-fiction achieved at the point where gravitation ceases, somewhere between here and China, impressed me deeply. Long and intense in-dwelling upon it had evidently brought about its achievement in me. Mind had exerted great power over matter and matter had knuckled.

Mind was not so superior this morning, however. I knew not my mental whereatness. I was a drug clerk in the employ of one Martin, at last remembrance. I might be anything decent now. I tried to find somebody in the house, hoping to have help in untying the knots in my head. But a thorough search and much noise brought no one to my rescue. So I started out at once for the drug shop of my one time employer and most intimate friend, Dick Martin. On the way I met no one I recognized, but I met those who must have recognized in me a freak, for to my surprise they all wore a most amused smile when they noticed me.

When I reached the store I found its outer appearance had changed since I knew it. There were two entrances, instead of one, as formerly. The magnificent windows connected with the first entrance had perfumery, bath sponges, hair and tooth brushes and other toilet requisites pleasingly displayed in them. The other side had but two plain windows not differing from those of a house, and containing no display of goods. Between them was a single door whose upper half was set with a designed glass. Thinking that this latter portion of the building had been converted into a dwelling, I entered the first door.

A room much more elegant than the one I had known greeted me. Beautifully carved, low mahogany counters under deep, wide, square cases; oval-wall and column display cases; glass shelving protected with sliding doors; cut glass containers, and by all these means a wonderfully clever and tasteful display of toilet requisites and like goods met my surprised gaze. There were three clerks. Only one of them was a man, and he clearly was not in much demand. He was rather peculiarly dressed, and it was perhaps his closely cut moustache that drew my attention to him as being of a sex differing from the others. His loose coat was made with loose sleeves, raised slightly at the shoulders, and with a waist which was tight fitting in the back. His trousers were different from anything I had ever seen. They were very loose and hung in folds about his legs; when he walked they flapped like the wings of a bat on the fly. I could fancy his legs presenting a dropsical appearance, should he be caught in a windstorm. His odd appearance led me to inspect closer the dresses of the girl attendants. I found them to consist of two parts, basque and skirt. The basque was rather tight-sleeved, had lapels, and was belted at what seemed to me a large waist for a woman. Just then one of the girls walked across the floor. I noticed that her skirt was split more than half of its length, so that from a little above the knees down, it approximated very loose trousers. This was hardly noticeable, however, as the garment was very loosely made. The girls' hair was cut down within a few inches of their heads, parted in the center and combed fluffy to give an appearance of looseness. Turning again to the man clerk I at once saw why my appearance had caused such amusement on the street a few minutes before. If others in looking at me were moved by any such feelings as I was in looking at this twentieth century product, they were not to be blamed for laughing.

But I now saw as I looked about me that this could not be the drug store, for though the goods were of the familiar side lines, only in more numerous kinds and greater quantities, there were no medicines about. So I said to one of the clerks:

"Can you tell me where Martin's drug store is?"

"Martin's is the next door above."

I walked out and into the door next above, which I then noticed had a neat silver plate bearing this legend: "M. C. Martin, Analyst and Pharmacist." The room which I entered had all the appearance of an elegant office, which I soon found it to be. Before the window, at a large open desk, was a young woman busily engaged in clerical work. At her side, and extending half way down the room, was a handsome oak glass-doored case containing surgical instruments, surgeon's sponges, bandages, lint, etc., etc. The room was softly carpeted in dark gray, and around about were several large, square, comfortable, leather-covered chairs. A table in the center of the room had the current newspapers and magazines on it. A work in oil of Sir Frederick Leighton's adorned one side of the room, and water colors and sketches made the other walls very artistic and rich in effect. Two or three palms graced the corners. Quiet and refined elegance was generally expressed.

As I walked into this room the young woman at the desk rose to meet me. Her manner was very businesslike and polite. Without waiting for her to speak, I asked:

"Is Mr. Martin in?"

"Mr. Martin died some years ago," was the astonishing reply; "but Mrs. Martin is in the laboratory. Won't you be seated? I will call her."

I sat down in one of the comfortable chairs, and resumed my survey of the room. Everything so surprised me that I was almost ready to doubt the evidence of my senses. Before I had long to think, however, Mrs. Martin came out. I recognized her at once, and felt rather provoked at her stare of non-recognition. I felt called upon to introduce myself.

"My name is Graham. I was some years ago a clerk of your husband's. Perhaps you do not remember me."

"I recall your face now, but I had not seen you in so long that there was nothing to connect you with a seeming stranger. Can I be of any service to you, Mr. Graham?" said this brusque and almost stiff-mannered woman, in a yet considerate and courteous way.

"I am surprised and sorely pained to hear of Mr. Martin's death. I knew nothing of it, and after some years' absence came in this morning with the hope of reentering his employ," said I, with a ready facility at stating a partial untruth which surprised me. I could not confide my strange episode to this stiff and business-like piece of ice, whose every attitude proclaimed her time worth a dollar a minute; and so I got out of the difficulty as best I could, stating, moreover, that I had been away from pharmacy and pharmaceutical affairs for some years. This I thought would also explain my anachronism of dress, which she was too polite to notice, however.

"I am in need of a good analyst in the laboratory, but are you sure you are fitted for this work? You have been away from pharmacy for some years, you say. But I will first show you our working rooms, that you may get some idea of our plant and its necessities."

She led me into the first room at the rear of the office. "This," said she, "is our compounding department."

It was certainly perfect in its appointments and general character. It was a plain, square room, with a working shelf-counter running all around it, except where the doors were. Below this counter were closets, drawers, etc. Above it was, first, an open space of 18 inches or so, divided into sections. Here, in special places made for them, were kept the graduates, mortars, test tubes, and the other appurtenances of the prescription desk. Above these spaces were the shelves containing the neat one and two pound salt mouths and tincture bottles holding the stock. In the center of the counter on each side of the room, was a square-bottomed copper sink, over which were faucets supplying hot and cold water. In one corner was a neat bookcase, containing pharmacopœias, dispensatories, works on dispensing, chemistry, botany, materia medica, bound volumes of journals, and other literature of like character. There were two pairs of men prescriptionists working, one of each pair doing the compounding, the other watching him and doing the checking.

Instinctively I felt the absence of "patents," proprietary elixirs, and others of that adventitious breed. This surprised me into saying to Mrs. Martin:

"Do you carry no 'patents' or 'proprietaries?' "

"A very few only. As the ranks of pharmacy became more and more infused with scientific workers, and these workers turned their attention more and more to the scientific side of their calling, realizing that only here lay salvation, both the public and the physician looked differently upon the skill and products of the really professional pharmacist. His enlargement of effort in analytical and manufacturing directions won the patronage of the physician, who had by this time found that proprietaries were not always what was claimed for them, and that tablet triturates and other condensed and "handy" forms of medication had a very limited use. We thus gradually grew out of proprietaries, and in reciprocity to the physician, largely gave up 'patents.' Former hatchets were buried, the prescription was revived, and manufacturing and compounding rapidly developed in the better of the pharmacies. If you will step this way, I will show you our little manufactory."

A long table in this long and narrow room had on it the most improved apparatus necessary to a well fitted but small pharmaceutical manufactory. Three men were busily at work. One was standing over a capsule placed on an electric stove, holding in one hand a thermometer, and with the other vigorously plying a stirring rod. The second, by the addition of one solution to another, was precipitating a salt; the third was working with a distilling apparatus, making what was proclaimed by its odor to be ethyl nitrite. Hanging suspended over the table was a large, movable, cone-shaped apparatus which I decided was for carrying off gases, odors and the like. On the shelves against the walls were boxes containing crude drugs, and bottles having in them the finished products. In one corner, as in the compounding department, was a library containing works pertinent to manufacturing and to pharmacy generally. Much else here and in the compounding and dispensing department I had not time to notice. Indeed, so surprised was I at it all, that I have since wondered if I observed anything with accuracy. In my confusion I said to Mrs. Martin:

"You evidence a professional business here that only a few years ago was almost impossible, so great was the competition. I do not quite understand it."

"There is quite as much competition as formerly, but it is differently distributed. Quite naturally the stores have fallen into different grades. The few more scientific and technical pharmacists have gradually drawn most of the professional trade to themselves. This trade has been in itself enlarged by the partial displacement of 'patents,' by the physician's patronage, and by the increase of examination of such matter as blood, urine, sputum and drinking water. Thus a few of us have been enabled to cut entirely loose from side lines (we ourselves first separated them into the room adjoining, but soon sold the department outright), and to specialize our technical departments. We are able to charge and maintain moderate professional prices, and competition affects us little, except as it prevents these prices from being excessive. The remainder of the pharmacies are about as they were before this division took place, except that much of their drug trade being taken from them, and competition the while growing fiercer, there are fewer of them and the struggle for sustenance is per force greater. There are, of course, many really scientific and capable pharmacists who are financially unable to conduct the professional pharmacy of to-day. Such as these easily find employment in some department of a pharmacy like ours."

We passed from the manufactory into the analytical room. Here were performed the bacteriological and chemical examinations of the secretions and excretions of the body, drinking water, and the salts, acids and organic drugs and preparations of the pharmacy. This evidently was where my services were required. Only one man was at work. He was working over a microscope, examining something which seemed to be giving him trouble, for just as we entered he was giving forcible expression to a word which my good breeding forbids me to repeat. On the other side of the room from this worker were the chemical apparatus and stock. When I saw these I was rather disheartened, for they evidenced a progression during the last few years that would perhaps render me incompetent, except after much study and experience.

"This will be your workroom, Mr. Graham, if you seem to us to be competent."

At this moment the office attendant appeared at the door. "Dr. Dow would like to see you, Mrs. Martin."

Mrs. Martin turned to me. "Please be seated," motioning me to an easy chair in the corner. "I will be back presently."

With a sigh of restfulness I sank into the chair. Coming into the material world after twenty years of absence from it, and seeing so much to surprise, so much to puzzle, so much to weary, I was exhausted from the experience. The excitement over for a time, I sank into a sort of stupor, and for the moment was lost to my surroundings. In this semi-conscious condition I soon became aware of a medley of sounds, which seemed to me like the din of a Fourth of July. I felt too inert to inquire of myself whence this came. And I had no interest in it. I would fain shake it off. I would escape it by deeper unconsciousness. But the demonstration grew louder. It began sorely to disturb my peace. It reverberated through the tired recesses of my brain, until I felt as if besieged by relentless forces which had my complete destruction in view. I was fast approaching an inability to offer the least resistance. My reason could stand this devilish onslaught no longer. I must arise and save myself before it is too late. Fiercely summoning my strength, I tried to rescue myself. But I was powerless. Suddenly all beneath me gave away and I was hurled down, down, down. Every moment I expected to be flattened into an unrecognizable mass. The thought horrified me and gave me strength. With one mighty effort of will I threw off the mental chains which had held me captive. My eyes opened. Somebody was bending over me.

"Great Scott! George, wake up, will you and put up this prescription for me? You must have been out last night:"

Consciousness came to me with a rush. Before me stood Dr. Jameson, an intimate friend of both Dick's and mine. He was looking at me with a very amused smile on his face. Behind him, grinning, was John, the junior. I looked about me in amazement. I was in the corner of the store behind the prescription desk which is given up to the safe, the desk, the office books, the small library and the high-backed, sunken-seated, old-fashioned chair. In this chair I was seated. On the desk beside me was Etidorhpa, which I had dropped an hour before to wander off into the reflection induced by the strange condition the travelers found themselves in when they reached the inner circle of the earth or sphere of rest, where their hearts stopped beating, the circulation of the blood ceased, and there was no longer any waste of tissue.

BLEACHING WAX AND STEARINE.

By S. RAMBOE.

In bleaching beeswax it is usual to expose the crude material in the form of rather thin, round cakes to the action of the sun, and in this way the wax does not lose or hardly lose any of the specific aroma, which is one of its much sought-for qualities. (Chem. Zeit.) As to the consistency and hardness of wax thus bleached it is equal to that of the raw material. Unhappily, this process has several faults; the chief of these is the long time which the operation takes, and this is a matter which affects the economy of the process to a large extent. Attempts have been made to abridge the time exacted by bleaching operations, but, unhappily, results have not responded to the hopes of the inventors of the methods proposed.

The process which has furnished so far the best results is that which consists in augmenting artificially the richness of the air in ozone. Practice shows us, in fact, that the bleaching rooms for wax situated in the country in the proximity of pine forests operate with much more efficacy than those which are by their situation placed in atmosphere less saturated with ozone. The artificial distribution of ozone is done by finely spraying spirits of turpentine or just lately by galvanic measures. Unfortunately, an effective abbreviation of the period of bleaching is only obtained in this manner when the wax has been melted to begin with in the presence of a certain quality of humidity. If this condition is not filled, the ozone produced, whatever may be the quality of it, has no action on the wax. The production of the ozone by turpentine is always perfect, for the simple reason that the peculiar aroma of the wax is better preserved in this way.

But although the period of bleaching seems to be sensibly shortened by the aid of ozone, nevertheless entire weeks are needed, and if the weather is unfavorable even entire months, to bleach the wax in satisfactory fashion. A number of processes of bleaching by the aid of drugs have been tried and practiced industrially with the object of arriving more rapidly at the end proposed, but unhappily none of them are capable of destroying the coloring matter alone without harming some of the other properties of the material. At the same time that color disappears the chemical products employed destroy the special aroma of the wax, which, of course, is very similar to that of honey. Moreover, methods of energetic oxidation have influence on the consistency of the wax, which they render brittle. Therefore, although bleaching by chemical means hardly needs more than twenty-four hours, and gives an absolutely white product, the process has not been generalized. In the few factories where it is adopted from 5 to 10 per cent. of matter naturally colored and aromatized is added to the bleached wax to recover as nearly as possible the tone and the perfume of the original product. Still, the product thus treated changes color and loses its perfume at the end of a few days. The essence of wax prepared by Schimmel & Co. has also been tried, but the results have not given satisfaction. The product aromatized by its means loses its perfume rapidly, and ends by giving out a disagreeable odor of gasoline. It follows, therefore, from what we have said, that the only way of reaching the end proposed is to look for some method of modifying to the best advantage the natural process of bleaching. Having arrived at this conclusion, the author has undertaken a series of experiments on the best manner of carrying the natural method out, and has arrived at the following conclusions:

1. The Proportion of Water in Wax.—Wax entirely dry exacts double the length of time for its bleaching as that which contains from 2 to 5 per cent. of water. If, therefore, an energetic ventilation is arranged, by means of which it is possible to pass moist air over the cakes of wax, a slight humidity will help the operation very greatly, especially if the cakes are not too thick.

2. Saturation with Humid Air.—When the air is saturated by steam vapor, four times as much time is required to arrive at an identical result, even when the other conditions are most favorable.

3. Surface Exposed.—All other conditions being equal, the time of bleaching is in direct relation with the amount of surface exposed. It is, therefore, of the highest importance to expose to the action of the air and sun as much surface as possible.

4. Temperatures.—If the wax, containing 3 per cent. of water and in slices as thin as possible, is exposed in a refrigerator at a little under freezing point to the direct rays of the sun no traces of bleaching are noticed for a long time. If, on the other hand, the wax is exposed to the direct sunlight at a temperature of about 75° F., bleaching takes place very rapidly (about 70° F. is sufficient for the commercial operation).

5. The Sun.—As we have seen in the preceding paragraph, the action of light is almost nil at low temperatures. According to the personal experience of the author, diffused daylight seems to have rather more energetic action than that of the direct rays of the sun, all other conditions of temperature, air, etc., being equal.

If we put these observations into practice, a white wax with the odor of honey will be obtained in a relatively shorter time. This aroma will not disappear after years of storing if the product is stocked in closed vessels and kept in an obscure place. In addition to the greater surface to be given to the matter to be bleached, great care should be taken not to work except in ventilated rooms provided with heating apparatus which can be regulated at will, so as to give the needed heat to the air in humid and cold weather.

If the wax which has been bleached is melted with virgin wax the bleaching of this latter seems to take place more rapidly; thus, for example, if two pounds of crude wax are melted with one pound of bleached material, only half the time will be needed to bleach this mixture that would be taken in bleaching three pounds of crude wax. We can say, therefore, that the bleached material bears in itself the power of bleaching, and this fact is in direct parallel with the other fact already noted, that a very considerable time is needed before the action of bleaching begins to show itself on the surface of the raw material, and that, on the other hand, as soon as the surface begins to show the bleach the effect produced transmits itself very rapidly through the whole of the mass.

If the wax is melted and poured on thin plates of iron and exposed thus to the bleaching agents, this also contributes to accelerate the action of bleaching. A bleach of surprising rapidity is got with the Laval "Emulsor." If the virgin wax is melted and made into an emulsion with water at from 75° to 100° C., and if after stopping the emulsionizing apparatus the mass obtained is thrown into cold water the result is to get a quantity of globules of wax of extreme tenuity, which in favorable weather are bleached at the end of two or three days. If the wax is melted to begin with, with a third of its weight of wax already bleached, the operation does not take more than forty-eight hours. As the apparatus gives a considerable yield (220 gallons of emulsion per hour), the process may be considered as a very practicable one from a commercial point of view. With the aid of this apparatus, which is capable of giving the matter to be bleached a very extended surface, we believe that natural bleaching can enter into serious competition with the chemical bleaching, at least so far as the saving of time is concerned. And if, on the other hand, the fact that the natural properties of the wax are preserved by natural bleaching is taken into account, we do not doubt that this new process will be universally adopted. The high prices actually obtainable, and the more and more frequent adulterations of the product will give an extraordinary value to a process which will leave the wax the natural and characteristic signs of purity.

With the same emulsionizing apparatus the chemical bleaching can be done in ten minutes as follows: The crude material is emulsionized in slightly alkaline water and brought up to 175° F., then after having been treated with hypochlorite of sodium and allowed to rest for ten minutes, hydrochloric acid is added until an acid reaction is obtained. The mass is then emulsionized anew in warm water to get rid of the acid which adheres to the particles, and a white wax is then obtained with a very fine grain and free from ash. Its only fault is that it lacks aroma. The same satisfactory results are got with Japan and Carnauba waxes.

Finally, we may note that the fatty acids for stearine making, whether got by distillation or expression, behave like animal wax in the presence of bleaching agents, and it is also possible to accelerate the bleaching of these products in the same way. The well known and frequent difficulties of manufacture, when the candles remain for entire weeks without changing in the bleaching room without a plausible reason for the phenomenon being apparent, arise without doubt from the insufficient state of hydration of the stearine, or from a too low temperature, or from the surrounding air giving off too much humidity. If, therefore, stearine already bleached is melted with crude stearine and emulsionized in lukewarm water, so that the mixture can be thrown into cold water with or without the addition of a little of oil of turpentine, a very white and beautiful stearine will be obtained in a few days even under bad conditions of climate. The stearine becomes very hygrometric by emulsion. The fusion eliminates the water, and it is only a very small proportion that the stearine retains in purely mechanical mixture. From this moment the bleaching takes place very rapidly. The candles moulded out of the stearine dry thoroughly during the bleaching and burn in a normal manner.

PERFECT VACUUM.—Professor Elmer Gates, of Washington (says Sci. Amer.), claims to have produced an absolutely perfect vacuum by filling a very infusible test tube with a glass melting at a very much lower temperature. Then by inverting the test tube and partially withdrawing the molten glass by suction, a space was left which, when the glass had solidified, was claimed to be perfectly vacuous.

THE MANUFACTURE OF RUBBER SUBSTITUTES.

Substitutes enter very largely into the compounding of rubber because of certain distinct advantages which they possess and which are not shared by coal tar or the simple mineral adulterants. They have not the vulcanizing effect of sulphur or the metallic oxides and sulphides. Their chief value lies in cheapening the stock without disturbing its working qualities or impairing the texture, finish or weight of the manufactured product. Their after effect on the life of the goods is, however, another matter.

The term rubber substitute may be broadly considered as including any substance possessing characteristics similar to those of unvulcanized rubber and adapted to displace it in compounding. Ordinary reclaimed rubber as well as the sulphurized oils are included in this definition.

The reclaimed rubber of commerce is obtained by steaming or devulcanizing old rubber waste, generally shoes, freed more or less perfectly from fiber. Having originally contained some real caoutchouc it is generally considered rubber of low grade rather than rubber substitute. Since its introduction its use has rapidly extended until it is now a very essential factor in the ordinary and cheap lines of goods and its presence is not entirely unknown even in the highest grades. As a substitute it ranks first in merit and general use; the annual output in this country alone reaching thousands of tons.

As a substitute it is most available in goods where color or extreme lightness are not essentials. Being chemically inert, that is free from any oxidizing tendency, it can be compounded with rubber in all proportions without injury to the new stock.

The sulphurized oil substitutes constitute a class by themselves and are distinguished as brown or white, although chemically they are essentially very similar. Any of the readily oxidizable, rejectable or drying oils combine freely, under proper conditions, with sulphur to form a more or less rubber-like mass. According to the selection of the oil and the mode of treatment we get brown or white substitute. Such oils as linseed, rape, mustard and peanut are well adapted to make brown substitute. The process is a simple one consisting in boiling any one of these oils or mixture of them in any proportion, with flowers of sulphur. The operation may be carried on over a fire or by steam in a jacketed kettle. The proportions are generally about eighty per cent. of oil and twenty per cent. of sulphur. The reaction is complete in three or four hours at the heat of eighty pounds of steam (325° F.). It is well to boil the oil out of doors or in a strong draught of air to carry off the noxious vapors. The mixture should be thoroughly stirred while cooking.

Mustard oil reacts quite promptly with sulphur, but gives a firmer product and one that breaks rather shorter than that from the other oils named. It is best used in mixture with them. Linseed gives off the most disagreeable odor and has no special advantage in point of quality of product.

The white variety of oil substitute is made by treating refined mustard, rape, castor or cocoanut oils separately or in mixture with sulphur chloride either in the cold or with moderate heat.

The light, porous variety may be made by mixing with the oil a small proportion of sodium bicarbonate which, under the influence of the sulphur chloride generates gas in sufficient quantity to render the whole mass very spongy.

The operation should take place in an earthern or lead lined vessel and the sulphur chloride added slowly and stirred briskly into the oil.

The proportion of sulphur chloride to oil should be about one to eight, and of soda to oil about one to twelve.

When the chemical action is over the product is allowed to dry for a couple of days before use.

A solid amber colored substitute is made in the same way and proportions, omitting the sodium bicarbonate.

All operations involving the use of sulphur chloride should be conducted in a strong draught and best in the open air to avoid the evil effects of the vapors.

Chemically the use of these sulphurized drying oils in rubber compounds is bad. They exert a marked influence in shortening the life of the goods because by their active chemical nature they hasten the oxidation of the rubber present to the brittle resinous products which give evidence of their existence in the compound by its loss of elasticity and by the hardening and cracking of the surface. There is little to be said for these oil substitutes from a chemical point of view. Their great practical value is entirely a matter of price, for they enable the manufacturer to cheapen the stock while maintaining the proper relative weight or specific gravity of the compound with reference to pure rubber.

The matter of specific gravity, or the ratio of the weight of any substance to that of an equal volume of some other substance taken as a standard, is a point of much importance. It governs the relation of pound price and piece price in rubber manufacture.

Specific gravity and the percentage of ash in a rubber compound once gave an indication of the amount of rubber present, but since the extensive use of oil substitutes they have no value as specifications of quality.

The specific gravity of caoutchouc or pure unvulcanized rubber is 0.915. It will therefore float in water about like ice, that is, nearly submerged. The oil substitutes are slightly heavier; enough so to sink in water. —India Rubber World.

THE CASTOR OIL PLANT.[*]

This plant has been known from extreme antiquity, specimens having been found in Egyptian tombs, supposed to be over 4,000 years old. It was known to the Greeks as Aporave, and to the Romans as Ricinus; the Hebrews called it Kikayon; it has been suggested that it was the plant translated in the scriptures as gourd. Oil expressed from its seeds was considered by the ancients, including the Hebrews, as one of their pleasantest oils for burning and for domestic uses, though its medical virtues were unknown to them.

In its native India this plant is a perennial, but as it has spread farther and farther into less congenial climes, it has, like the cotton plant, lost that habit and is known to the inhabitants of the United States as an annual.

There are numerous varieties, but most of them are derived from the Ricinus communis. In India and the United States, the two largest producers of castor beans, Ricinus communis is, almost without exception, the variety used for oil production, although others are sometimes used as ornamental plants, yet Ricinus sangineus, as will be seen from the following analyses taken from Semler, is the best oil producer:

	Seed of R. sangineus.	Seed of R. communis.
Water	4.40	4.10
Fat	46.95	45.55
Starch	8.87	12.50
Nitrogenous substances	3.78	2.40
Non-Nitrogenous substances	6.35	4.40
Fiber	25.50	27.70
Ash	2.90	2.94

These analyses were of seed grown in the United States, and therefore the oil content is not so high as it would have been had the seed been grown in some tropical, or even semi-tropical country, where from 50 to 60 per cent. may be expected.

The common idea, that the castor bean can be cultivated wherever Indian corn will thrive, may be true as far as its use as an ornamental plant only is desired, but is not applicable when it is to be cultivated in commercial quantities.

There being no use to which other parts than the bean of the plant can be successfully put, and the value of this being dependent upon its oil content, the general truth applicable to nearly all oil bearing plants, viz., "the warmer the climate the larger the per cent. of oil," greatly diminishes the value of this crop grown in the northern half of the corn belt.

Because thrifty farming requires the planting of only such crops as will reach their highest development and yield a satisfactory pecuniary return, the castor bean can not be successfully cultivated in the northern part of the United States, although Indian corn thrives there, and some varieties of the castor bean will mature seed. Even in sections where the warmth and period of growth are sufficient for the successful growth and development of oil by the castor bean, a very deep and fertile soil is required, well supplied with nitrogen, phosphoric acid, and potash, and, if it is not virgin soil, the use of manure or commercial fertilizer can not be omitted.

The soil must also be neither too light nor too heavy, too close nor too porous—stiff clay is unfitted for the culture of the castor bean, also light sand. Like Indian corn, it demands a sandy loam or a clay loam for the best results. In every case the soil must be friable, deep and well drained.

The castor bean may follow any clean crop, or it can be cultivated successfully for several years in the same field, provided a sufficient manuring is given. A mixture which contains all the needed elements of plant food can be made as follows:

500 ℔ cotton seed meal.
1,000 ℔ stable manure.
500 ℔ superphosphate.

This should be kept in heaps under a roof, and should be sufficiently moist to prevent firing. Of this mixture from 1,000 to 3,000 pounds should be used per acre, according to the fertility of the soil and the amount of manure used the preceding year.

Planting should be in hills five or six feet apart each way, and the seed, after being soaked twelve hours in luke-warm water, should be placed two in each hill, and carefully covered with one-half inch of soil.

When three or four inches high the weaker plant should be removed, leaving one to each hill—leaving two plants to the hill is a very bad practice followed by some growers; it is better to reduce the distance between hills even down to 4 x 2¼ feet, if there are not enough plants to the acre, than to crowd them by leaving two in the hill.

The ordinary surface stirring and weed destroying is essential. The plow has no place in castor bean cultivation after planting, as it cuts too deep or throws to much soil to the plants, which will not bear being hilled up. The horse cultivator, with hand hoes for working close to the plants, gives the best results.

The seed spikes are collected as soon as the pods assume a brownish color, and before the seeds are so far matured as to drop out of the pods in handling. When gathered, they are exposed to the sun until the seeds part freely from the pods. Frequent gatherings are necessary in order to remove such spikes only as are in proper condition. The profits of this culture are said to be somewhat greater than that of corn, from 20 to 25 bushels per acre being an average yield.

According to information supplied by Mr. William Saunders, Horticulturist and Superintendent of Gardens and Grounds, the following is the ordinary process of extracting the oil from the bean: The seeds are first cleaned from dust and all extraneous matter, then placed in an iron vessel and submitted to a gentle heat, which facilitates the extraction of the oil. They are then placed under the action of a screw press, which liberates a whitish oily liquid, which is then mixed with water and boiled for some time, the impurities being skimmed off as they rise to the surface. A clear oil is at length left upon the top of the water, the mucilage and starch being dissolved, the albumen coagulated by the heat, forming a whitish layer between the oil and the water. The oil is further clarified by boiling it along with a little water, the heating being continued till aqueous vapor ceases to rise. This drives off the acrid volatile matter; but if heated beyond what is necessary to the removal of the water, the oil acquires a peppery taste and a brownish color.

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[*] Misc. Circular No. 1, issued by the U. S. Department of Agriculture.

It is said that the superiority of the best Italian castor oil, which is characterized by the absence, in a great measure, of the usual nauseous flavor of ordinary castor oil, is owing to its being prepared in summer from seeds collected during the previous year. The outer skin, which has become somewhat hard, is cracked by slight blows of a hammer, and when this shell is removed, the interior is submitted to gentle and continuous pressure. The exuding oil is filtered with as little exposure to air and light as possible. This makes an expensive oil.

Another method of procuring castor oil comparatively free from unpleasant taste or smell, also practiced in Europe, is to boil the seeds in water for two hours, when they are taken out and dried by exposure to the sun for several days. The skin or shell is then removed and the seeds pounded, then boiled in fresh water until the whole of the oil has risen to the surface. Three and a quarter pounds of seed will, by this process, yield one quart of oil of a fine straw color, but it is of inferior quality. In this country medicinal castor oil is usually manufactured by cold expression from the crushed beans. In order to rid the oil of a disagreeable acrid principle that the beans contain, they are usually heated for some time until they are browned but not burnt. Then the hulls are broken or crushed by running the beans through a mill for the purpose, and the pulpy mass is inclosed in bagging and subjected to hydraulic pressure. After this cold drawn oil has been expressed, a second, inferior quality is obtained by treating the beans with hot water, and again pressing them. The oil is then heated for some time not quite to the boiling point, and the coagulated albumen and mucilage which rises to the top is carefully skimmed off. The oil is next strained and is ready for market. Castor oil for machinery, wagons, etc., may be expressed from raw beans treated with boiling water.

When castor oil is heated in a retort, about one-third of it will distil over and a substance resembling India rubber will remain, which saponifies with alkalies.

This oil is largely used in soap manufacture and makes a clear, light colored soap which dries and hardens well.

Castor oil is the thickest and heaviest of the oils, its specific gravity being 0.969 at 53° F. At a temperature of 4° F. (—18° C.) it becomes a transparent, yellow, solid mass. By exposure to the air it becomes rancid, thick, and at last dries up, forming a transparent varnish. It dissolves readily in its own volume of pure alcohol and is bleached by exposure to sunlight.

TOXICITY OF ACETYLENE.—From the Italian electrical journal, L'Elettricista, Sci. Amer. abstracts an article by Professor Mosso and Mr. Ottolenghi, in which they describe their researches made to test the poisonous action of acetylene on various animals, such as dogs, birds, frogs, and rats, etc. They found it to be a strong poison. A small quantity in the air or inoculated in the blood is followed by death, and even when the animals are resuscitated with fresh air before death, they die afterward. A mixture of 20 per cent. of acetylene in the air is followed by death in one hour.

Treatment of Plants with Ether.

Consul Kirk, of Copenhagen, under date of February 19, 1897, sends to the Department of State the following translation from Dannebrog of February 12, 1897:

An Interesting Discovery in the Physiology of Plants.

Mr. Johannsen, lecturer at the Agricultural High School, delivered a lecture two evenings ago on the results so far obtained by the etherizing method, which consists in developing plants earlier than is normal to them by exposing them to the influence of ether fumes. We give below the principal points of the lecture.

By exposing sleeping plants to the influence of ether and chloroform, the result is obtained that each plant, after the treatment with ether begins to shoot; they have thus probably been awakened from their previous condition of sleep or inactivity. This sleep is due to a regular stoppage of activity, which causes the growth to cease.

It is on this cessation of activity that the ether has effect. The questions now arise, Has this discovery any practical interest for our gardeners? Can the ether dispel the condition of sleep from all plants? Can the plants, awakened before their proper time, develop in a normal manner and become useful and salable? The last question Mr. Johannsen has not yet succeeded in solving. The preceding (can the ether dispel the condition of sleep from all plants?) is, however, theoretically the most important.

Mr. Johannsen's first experiment was made with willow plants and next with bulbs and hyacinths. In the fall of 1894 he experimented with lilacs. As a result of these experiments, it was proved that the etherizing of the bulbs has no effect before the formation of the roots; the condition produced by the ether passed before the formation of the roots had advanced sufficiently to cause budding. Mr. Johannsen has also made some experiments with La Reine; the growth was considerable and the development of the bulb was in every respect satisfactory. The experiment was commenced on November 20 and on December 19 a part of the tulips were salable. The problem was solved as regards La Reine. It would, however, be of greater interest to produce lillies of the valley. The experiment in this direction in 1895 was promising, but the results this year were very poor.

Interesting and important are the experiments with ligneous plants. Lilacs grow splendidly when placed in an air-tight compartment and exposed forty-eight hours to the effect of 500 or 600 cubic centimeters of ether, and then placed in a hothouse. Just before Christmas the plants had developed splendidly. The etherizing of the plants will cost 4 to 5 öre (1 to 1½ cents) each. The main point is to get the plants to shoot at any time before Christmas, even in September and October. Mr. Johannsen has had blooming lilacs on the 10th of September, but the plants did not develop regularly. It has, on the whole, been proved that the ether is not beneficial if applied before the middle of November.

The ether causes a derangement in the independence which should characterize each of the different stages of the plant. The development is not harmonious, owing to the too strong or too weak action of the ether. Mr. Johannsen will now try to gradually bring the plants to stand the action of the ether by giving them larger and larger doses. Experiments were made with certain seeds; for instance, the lupine grass and barley, and it was at once demonstrated that increasing doses of ether had a powerful effect. It is not so much the repetition of the ether which is the important point in the treatment, but its increasing application. The small and light doses of ether have a harmonizing and equalizing influence on the growth of germinating plants.

With these results as a guide, the experiments will be continued next year with more expensive potted plants. Mr. Johannsen received about the middle of December twelve good specimens of beech trees, and before the end of the month they were all budding and the development was satisfactory.

It can be said that some progress has undoubtedly been made, but no one can tell to what astonishing results this discovery may lead. Tulips, lilacs, etc., can be developed much earlier and have a pretty color and great durability, as the ether frees the plant of decomposable matter.

To etherize the plants, they are placed in an air-tight receptacle and exposed from twenty-four to ninety-six hours (generally forty-eight hours) to the influence of the ether. Cylindrical glasses are used for small plants, and for large plants an oil-painted box, the interior of which is lined with tin foil, 4 feet high and long and 2½ feet broad. On the lid a small hole is made, which is closed with a cork and the ether is conducted through this hole. As ether is very inflammable, great care must be taken not to bring candles or matches near it. The ether is dissolved at from 15° to 20° C.

Copal from the Zanzibar Market.

Copal is a collective name for a number of resins that exhibit great differences in their chemical and physical properties, says the Oil and Colorman's Journal. They may be arranged in the following groups:

(a) East African, probably derived from Trachylobium mossambicense and Hymenea verrucosa.

(b) West African, said to be obtained from Guibourtia copallifera, or from species of Copaifera.

(c) Kauri copal from New Zealand, the botanical origin of which is Dammara australis.

(d) Manila copal, obtained from Vateria indica.

(e) South American copal, derived from Hymenea courbaril, H. stilbocarpa, Trachylobium martianum, and T. hornemannianum.

The first three are fossil resins, and are dug up out of the earth, while the last two are collected from the plants yielding them.

To the East African copals belong the following three varieties:

1. Copal from Mozambique.
2. Copal from Madagascar.
3. Copal from Zanzibar.

The purity and hardness of the last variety render it the most valuable. The details that follow relate to that variety only. This must be emphasized, because many statements are met with without any mention of the variety of copal to which they refer.

From Bagamoyo, in East Africa, the expert received raw (unwashed) copal, pure copal, and specimens of the tree yielding it. The resin is brought down by the natives to Kiboa from districts removed from the coast; the botanical specimens came from Usegna, which lies inland westward from Bagamoyo. The commercial resin, obtained from a German firm, agreed in its characters with the genuine specimens sent from East Africa.

Zanzibar copal, finely powdered, melts at about 140° C.; it is slowly but completely soluble in alcohol; benzol, chloroform, and glacial acetic acid dissolve about 30 per cent., ether about 34 per cent., petroleum spirits and carbon bisulphide about 10 per cent.

When boiled with alcohol the resin caked, and only a slight proportion dissolved, but by repeated digestion with alcohol it could be brought entirely into solution and precipitated with water. The resin thus purified was more soluble in the menstrua previously mentioned, and dissolved also in boiling very dilute solution of potash (0.1 per cent.). All attempts to separate it into other constituents were unsuccessful, nor could it be saponified. It appeared to consist of resin-acids, the principal of which, constituting about 80 per cent. of the resin, was called trachylolic acid. This acid could be obtained with difficulty in minute sphaero-crystaline masses melting at 168° C. From it the potassium copper and iron salts were prepared. A second acid, present to the extent of about 4 per cent. only, was also obtained; to this the name of isotrachylolic acid was assigned. These two acids, together with about 6 per cent. of a-copal resin and b-copal resin, a bitter principle, and volatile oil forms the constituents of Zanzibar copal, as far as could be succeeded in separating them.

An examination of the stems sent from Usegna showed that, although the primary cortex contains schizogenous secretion ducts, these are soon thrown off as the secondary cortex is produced, and in the bark of other twigs and of the stem no ducts could be found. The resin appears, therefore, to the author, to be a pathological product.

NEW TOILET SPECIALTIES.

G. H. Dubelle contributes to Chemist and Druggist a number of novel profitable extras, as follows:

Myrrhodol.

Tooth and Mouth Wash.

Eau de Cologne	16 ounces
French Rose Water	8 ounces
Distilled Witch Hazel	8 ounces
Tincture of Myrrh	8 ounces
Glycerin of Borax	4 ounces
Salicylic Acid Soap	4 ounces

Dissolve the soap in the eau de cologne and tincture by a gentle heat; then add the other ingredients and filter. A few drops to be used on the tooth brush.

Sweet Mitcham Breezes.

Very Fine and Fragrant Perfume.

Rectified Spirit	25 ounces
Esprit de Rose, triple	5 ounces
Mitcham Oil of Lavender	1 ounce
Tincture of Ambergris	½ ounce
Tincture of Musk	¼ ounce
Oil of Bergamot	¼ ounce

Mix. Let it stand some days before filtering.

Mothol.

Pleasant Deodorizer and Moth Preventive.

Rectified Spirit	40 ounces
Tincture of Capsicum	5 ounces
Naphthalene	1 ounce
Absolute Phenol	1 ounce
Menthol	½ ounce
Oil of Lemongrass	½ ounce

Mix and filter. Use in atomizer.

Beauty Blanche.

Gives Softness, Delicacy and Whiteness to the Skin.

Distilled Witch hazel	12 ounces
Prepared Cucumber Juice	12 ounces
French Rose Water	6 ounces
Essence of White Rose	6 ounces
Glycerin of Borax	4 ounces
Prepared Talc	4 ounces
Oxide of Zinc	2 ounces
Tincture of Benzoin	2 ounces

Mix all together well.

Perspirol.

For Excessive Perspiration of Hands and Feet.

Prepared Venetian Talc	20 ounces
Powdered Orris Root	10 ounces
Oxide of Zinc	5 ounces
Powdered Tartaric Acid	5 ounces
Powdered Boric Acid	5 ounces
Salicylic Acid	2½ ounces
Menthol	¼ ounce
Oil of Eucalyptus	¼ ounce

Apply to hands and feet, or sprinkle in gloves or stockings.

ACETANILID MIXTURE.—According to Dr. McMechan, of Cincinnati, the following mixture is very agreeable, and particularly suitable for administration to children:

Acetanilid	1½ drams
Mucilage Acacia	1 fl. ounce
Syrup	1 fl. ounce

Tablespoonful every three hours. (Am. Med. Surg. Bul.).

PHARMACY.

MOUTH WASH TABLETS.—Bernegau (Pharm. Centrh.) directs this formula for 100 tablets: Heliotropin, 1 cgm.; saccharine, 1 cgm.; salicylic acid, 10 cgm.; menthol, 1 gm.; milk sugar, 5 gm.; spirit of rose, q. s. May be colored red with eosin, green with chlorophyll, or blue with indigo carmine.

DISGUISING THE TASTE OF CASTOR OIL.—Klein, of Chaifa, Syria (Therapie der Gegenwart, Pediatrics, Br. & Col. Dr.) recommends the following method of administering castor oil, which he learned from the Arabs: Pour 15 to 20 grams of castor oil into a glass of milk, and warm the mixture, with frequent stirring. In a few minutes an emulsion is formed, which may be sweetened with orange peel syrup. In this form the oil loses its disagreeable taste, and besides, smaller doses are needed to obtain the desired results. Fifteen to twenty grams will usually be sufficient to act as a purge in the adult.

POISONING WITH INSECT POWDER, derived from pyrethrum flowers, is so rare, notwithstanding the widespread domestic use of the article, that a case reported by Bosredon (Bull. Gen. de Therap., Pharm. Journ.) is of considerable interest. An infant, playing with a cardboard box of the powder, broke the lid and got the powder into the eyes, mouth and nostrils. When medical aid arrived convulsions and vomiting had set in, the heart beats were feeble and the respiration slightly quickened. After carefully removing the adherent powder, an emetic of ipecacuanha produced free vomiting, and except for slight inflammation of the conjunctiva the patient quickly recovered.

SALICYLIC ACID IN LIME JUICE.—At Liverpool a shopkeeper was summoned for selling lime juice cordial which was alleged not to have been of the quality and substance demanded by the buyer. A portion was submitted to the public analyst, who certified that it contained 100 grains of salicylic acid per gallon, a quantity which rendered the sample unwholesome. The manufacturer in this case had put some antiseptic in for the purpose of preserving the cordial, and to make sure of preserving it he had put in more antiseptic than cordial. Medical men agreed that after 26½ per cent. of antiseptic had been added, the article, when used as food, became injurious. A fine of 5s. and costs was imposed. (Food and Sanitation.)

THE BITER BIT.—A singular case of theft, containing the elements of both tragedy and comedy, is reported from the village of Baddo, in the Sharakpore Tahsil of Lahore District (Br. & Col. Dr.). Five thieves broke into a house and carried away all the portable articles they could lay hands on. Among the things stolen was a box containing a quantity of confection of strychnine belonging to a native doctor. Finding the taste sweet and agreeable, four of the burglars ate a good bit of what they believed to be a new kind of jam, but the fifth consumed only a few grains. They had proceeded but a short distance when the poison began to do its work, and the four men died in horrible agonies within a few minutes. The last one, who had swallowed a very small quantity, somehow managed to totter home. The stolen articles were all recovered, being picked up on the road.

A TASTELESS QUININE COMPOUND is of recent exploitation (Ph. Ztg., Pharm. Rev.). Quinine chlorcarbonic ester ($O.Cl.CO.C_{20}H_{23}N_2O_2$) is said to have the advantage over quinine of being free from bitter taste, while dissolving with sufficient rapidity in the stomach to insure prompt absorption. According to the Vereinigten Chininfabriken Zimmer & Co., in Frankfurt, this preparation is manufactured by allowing phogene, either as a gas or dissolved in benzol toluol, etc., to act upon anhydrous quinine, either dry or dissolved, or suspended in a proper medium. The crystalline mass so formed is washed with benzol and then digested with water to remove the quinine hydrochlorate, which is also formed. Quinine chlorcarbonic ester crystallizes from alcohol in fine colorless needles, m. p. 187°-188°; it is less basic than quinine and gives in solutions the thalleioquine reaction.

SHARK'S LIVER OIL.—A quantity of oil is obtained round the Norwegian coasts from the liver of the "basking" shark, says a foreign exchange, and this finds its way into some of the inferior qualities of cod liver oil. How far this is correct, or whether the shark oil has an equally good effect as that of its neighbor, report does not mention. So many men have engaged in the capture of this shark that it is at least pleasant to learn that the fish is likely to be exterminated. With a length of 40 feet, and a liver capable of yielding 600 gallons of oil, the keenness of the search for this monster can be appreciated. The formidable character of the fish may be understood when the fact is mentioned that, added to its great length, it has seven rows of teeth, 200 in each row; but, unlike other species of shark, we read it is not voracious, and subsists mainly on other fish. It is killed with harpoons, and the chase is an exciting and somewhat dangerous one, as the boats are liable to be overturned. (Ex.)

ODORLESS TURPENTINE OIL.—It is supposed that the odor of turpentine oil is not due to its principal constituent, pinene, but to an oxidation product of this hydrocarbon. This oxidation product is supposed to be an aldehyde, probably $C_{10}H_{16}O_3$, and to it the strong odor of ordinary turpentine oil is said to be due. It is generally known that upon rectification with water vapor, especially after the oil has been shaken with lime water or milk of lime the oil assumes a much more pleasant odor. However, the amount of aldehyde is said never to exceed 1 per cent., because it soon condenses with the elimination of water-forming resinous substances, thus causing the thickening or resinification of the oil. E. von Szigethy (Neuste Erfahr. u. Erfind., Pharm. Rev.) has recently obtained an odorless turpentine oil by rectification in partial vacuum (12 mm.) or rather in a rarified atmosphere of carbon dioxide. Szigethy claims that the odor of turpentine oil is due only to the oxidizing influence of the air.

EXTRACTING THE PERFUME OF FLOWERS.—Since many flowers do not contain the whole of their odoriferous principles ready formed, but secrete them gradually as long as the vital action continues, Passy suggests (Comptes rendus, Pharm. Journ.) that by prolonging the life of the blooms for a further period than is possible by the process of enfleurage with fats, as at present carried out, a better yield and more satisfactory results would be obtained. For this he suggests the use of water. The flowers are immersed in that fluid, and as soon as it becomes saturated with the odor it is replaced with fresh. The aqueous solutions are then extracted with ether, upon the evaporation of which the odorous bodies are left in a pure state. Simple water might with advantage be supplemented by a saline solution of the same osmotic power as the juices of the plant. The author states that he has experimented with a number of flowers, with good results, particularly in the case of lily of the valley.

THE ARTIFICIAL COLORING OF BIRDS.—The Echo Médical du Nord for April 18 states that Dr. Sauermann has published a series of very curious observations regarding the artificial coloring of birds. It is known, he says, that the plumage of canaries which are fed with Cayenne pepper changes from yellow to red. This pepper contains, besides a coloring matter, an irritant principle and a fatty substance. When these two principles are extracted by maceration in alcohol, the pepper loses its coloring properties. If, however, the product of the maceration is combined with olive oil the coloring action is restored, and it is concluded from this that the fatty substance of the pepper is the necessary vehicle of the coloring matter. Experiments made on perfectly white chickens gave the same results. These chickens had the property of anticipating a change of temperature by a very pronounced change of color. The yolk of the eggs of these chickens was of a very intense red. The same experiment was tried with the root of Anchusa tinctoria, and a violet-red was obtained.

SODIUM PEROXIDE AS A GROUP REAGENT is advocated by S. W. Parr (Jour. Am. Chem. Soc., Phar. Jour.) who has found it possible by this means to avoid several of the complications usually attending the ordinary procedure for the separation of the metals of the iron group. His method is to add a small porcelain teaspoonful of the peroxide to the slightly acid solution, which is then heated to complete decomposition, and finally boiled for some minutes after all the oxygen seems to be driven off. Iron, manganese, cobalt and nickel are precipitated, while aluminum, zinc and chromium remain in solution. A table based upon the application of this method to qualitative analysis accompanies the paper.

FROHMANN'S DENTIFRICIAL SOAP.—Dr. Frohmann, the most prominent dentist in Berlin, Germany, is strongly opposed to all ingredients in dentifricial preparations, whether powders, pastes, liquids or soap, that have a wearing or abrading action on the enamel of the teeth, as well as every description of insoluble matter (chalks, pumice, etc.), and especially to all those substances which have any chemical action on the teeth, all of which constitute component parts of almost all dentifrices in the market. The doctor recommends, instead of these, a soap with the following formula:

Thymol	25 parts.
Extract of rhatany	100 parts.
Glycerin, hot	600 parts.
Magnesia, burnt	50 parts.
Sodium biborate	400 parts.
Oil of Peppermint	100 parts.
Soap, medicinal, sufficient to make..	3,000 parts.

Dissolve the thymol and extract of rhatany in the hot glycerin, and add the other ingredients, with constant agitation. He advises the use of this soap after breakfast and dinner, and before going to bed.—Amer. Soap Jour.

A NEW LIQUOR.—The mysteries of taste are proverbially inexplicable. The British Medical Journal calls attention to "a nauseous intoxicant" which has found favor with the lower deep of inebriate Edinburgh. It is a combination of methylated spirit and paraffin oil. Some proportion of newly distilled whisky kept in bond fails to mature, and undergoes decomposition. It has then no attraction for the ordinary spirit drinker, and is therefore sold for use in furniture polishing and other devices of art. It was found, however, that the methylated spirit was consumed by some hardy inebriates of the poorer class, and to make it unpalatable the authorities added naphtha or paraffin oil. Even this precaution is not wholly successful, and the result is that groups of men and women are to be seen in certain parts of the Modern Athens more or less holpelessly intoxicated with "dynamite," as the disgusting brew has, not inappropriately, been nicknamed. The evil effects that "dynamite" must have on the nervous system need no demonstration. The famous Irish description of "a torchlight procession down the human throat" would fairly apply to this latest method of inebriety. The British Medical Journal suggests that it might be suppressed in the same way as ether drinking in Tyrone, and for the same reason—that it is a fraud on the revenue. It is perhaps not the highest motive for dealing with intemperance, but in this case it may serve.

CHEAP JELLIES AND CATSUPS.—In California a vigorous warfare is being waged against adulterated and sophisticated foods. Recently the chemist of the Board of Health made a report of analyses of jellies, catsups, etc. Out of fifty-five samples of jellies, nine were found pure, eleven were adulterated within the meaning of the pure food law, and twenty-five were fraudulent substitutes. What cheap jellies are made of is indicated by the following extracts from a long list published (Amer. Gro.):

"Golden Star" lemon jelly, manufactured by Tillmann & Bendel.—Consists principally of starch jelly and tartaric acid; contains some lemon.

Orange jelly, from Faust E. Mascherine.—Not orange jelly, but made of starch jelly and tartaric acid.

"Epicurean" raspberry jelly, manufactured by Tillmann Canning Company, Oakland.—Compounded with raspberry and apple jelly and adulterated with starch.

Raspberry jelly, from Dick von der Menden.—Apple jelly colored with coal tar colors.

"Paragon" raspberry jelly, manufactured by Temescal Packing Company.—Starch jelly colored with coal tar colors.

Tomato catsup, from Maas Packing Company.—Below the standard in solids; contains boric acid, salicylic acid and coal tar coloring.

"Paragon" lemon jelly, from Temescal Packing Company.—Not lemon jelly; composed of starch jelly and tartaric acid.

"Paragon" blackberry jelly, manufactured by Temescal Packing Company.—One-half blackberry and one-half apple jelly, colored with coal tar colors and adulterated with starch.

The law should compel the manufacturers of such substitutes for pure jelly to name the contents on the label and leave it optional with the purchaser to decide whether he cares to use imitation or fraudulent jellies.

THE TREATMENT OF EXCESSIVE SWEATING OF THE HANDS AND FEET.—In the Wiener Medizinische Blätter for April 15 we find abstracts of two articles on this subject, more particularly hyperidrosis of the feet. In the first, by Noebe (Medizinische Revue von Loewen; Journal de Médecine de Paris, 1895, No. 50), the author treats of four methods: 1. The wearing of such foot-gear as will favor evaporation of the perspiration, such as cloth shoes. 2. The use of chemical desiccants: (a) alcohol with tannin, alum and naphthol; (b) salicylated talc (a mixture of salicylic acid, alum and talc), salicylic acid with starch and tannin, powdered tartaric acid and sulphur; (c) a solution of chromic acid of the strength of from 5 to 10 per cent.; (d) a solution of iron chloride in glycerin. The so-called military sweat powder, he says works much better if it contains as much as 50 per cent. of salicylic acid, with the addition of tannin, alum, etc. 3. The production of complete desquamation of the horny layer of the epidermis by maceration with diachylon plaster. 4. The employment of an anthidrotic solution containing 25 per cent. of hydrochloric acid. The feet may be immersed for ten minutes in undiluted commercial hydrochloric acid twice a week for from five to eight weeks, and then at longer intervals. After each application the feet, especially the spaces between the toes, should be washed with warm soap and water, and if the acid has caused pain, a salve should be applied. With patients who are very sensitive, a 25 per cent. solution of the acid may be used at first, and the solution be gradually increased in strength until finally the crude acid is used undiluted. Equally good results are obtained with a 10 per cent. solution of silver nitrate painted on the sole of the foot and on the interdigital spaces every morning until the horny layer is shed. This procedure, he says, gives better results than the employment of chromic acid, and is free from the dangers of that substance.

[If (says N. Y. Med. Jour., which prints the above) any of our readers think of trying the hydrochloric acid treatment, we should recommend great caution as to the strength of the solution employed; it would certainly be risky, we think, to begin with the use of the undiluted acid. Possibly the author has in mind something milder than what we know in this country as crude hydrochloric acid.]

The other article is by Adler (Prager Medicinische Wochenschrift, 1896, No. 39), who distinguishes two classes of remedies—those that act as absorbents and those that diminish secretion. In the first class, the dusting powders are chief; but they have to be used every day, and so they soon get to be unpleasant. Moreover, they become caked with the secretion and make walking painful. Among the remedies of the scond class, the author has found none better than the formalin solution of the shops. When it has been used for two or three days, a soft of scurf forms and the secretion suddenly subsides. The effect lasts for two or three weeks, according to the severity of the trouble and the thoroughness of the applications. Any fissures that may exist must first be healed; otherwise the formalin will cause severe burning. Care must be taken also that the fumes are not inhaled, as they are highly irritating. When the hands are affected, only weak solutions should be applied to them.

Some New Remedies.

Merck's Berichte (Mar., 1897) contains much information on newer remedies. In addition to previous liberal extracts, the following are presented:

NUCLEOHISTON is a white powder which is soluble in water, mineral acids and alkalis. It is an albuminoid body extracted from the lymphatic and thymus gland of calves, etc. Lilienfeld regards it as the active principle of the leucocytes. By means of certain chemical reagents nucleohiston can be split up into nucleïne and histon. Nucleïne and its sub-element, nucleïnic acid, tend to accelerate the coagulation of blood, whereas histon produces on the coagulation of blood a retarding effect. E. Freund and Grosz have pointed out that histon, like other substances tending to retard coagulation, possesses both bactericidal and antitoxic properties. It may, therefore, be rendered subservient to the modern endeavors of producing passive immunity by substances of a non-bacterial origin.

PERONINE is the hydrochlorate of benzyl-morphine and is of the chemical type

$$C_{24}H_{25}NO_3.HCl = C_{17}H_{18}NO_2.O.C_6H_5.CH_2.HCl.$$

It is a voluminous white powder which freely dissolves in water and dilute alcohol, especially if heated, but it is insoluble in chloroform and ether. Professor von Mering describes peronine as a good narcotic. It is weaker than morphine, but manifests the objectionable secondary action of this alkaloid in a far less degree. Schröder places the action of peronine between that of morphine and codeïne. As compared with the latter it has the advantage of inducing a better and quieter sleep without producing an excited condition. Occasionally it causes obstipation. Peronine is particularly useful for relieving the troublesome coughing accompanying pthisis and bronchitis. It also acts as a beneficial sedative, according to Dr. von Mering's statements, in asthmatic troubles, also in rheumatic and neuralgic pains. Peronine is given in doses which are about two to three times greater than those of morphine. A single dose is therefore 0.02 to 0.04 grm. (gr. ⅓—⅔). The maximum which may be given is 0.06 grm. (gr. 1) per dose, and 0.2 grm. (gr. 3½) per day. Peronine, being as bitter to the taste as morphium or codeïne, may be given in the form of pills or as a syrup, or solutions of peronine may be taken with a little sugar water.

PSEUDOHYOSCYAMINE, $C_{17}H_{23}NO_3$, forms needle shaped crystals of a yellowish color, which are sparingly soluble in water and ether, but which freely dissolve in alcohol and chloroform. It melts at 133° to 134° C. This alkaloid, together with hyoscyamine and hyoscine, is contained in the leaves of Duboisia myoporoides, from which Merck first isolated it in 1892 and studied its chemical constitution. Its physiological examination was not undertaken until three years later by E. Buonarotti, clinical tests having previously been made in 1894 by G. Guicciardi. Buonarotti ascribes to the alkaloid mydriatic properties. If applied hypodermically it does not even in large doses accelerate the impulse of the heart. It has, in fact, a retarding action; neither has it a paralyzing action upon the nervous vagus. Without manifesting the disturbing properties of atropine, it moderates only the secretion of saliva. Pseudohyoscyamine does not, even if administered in considerable doses, produce toxic phenomena, and it does not serve as a substitute for duboisine (a mixture of pseudohyoscyamine, hyoscyamine and hyoscine) in hystero-epileptic convulsions. Guicciardi has successfully employed pseudohyoscyamine as a sedative in the treatment of various forms of psychical and motor excitation of maniacal imbeciles and hysterical patients.

URANII ET AMMONII-FLUORIDUM, $UO_2Fl_2 + 4NH_4Fl$ + aqua. A greenish-yellow crystalline powder or prisms of the same tint, soluble in water. This double salt of uranium serves for the demonstration of Röntgen rays and has been recommended by Melckebeke as a substitute for barium platinum cyanide, the latter being 15 times as costly. Van Heurck states that this preparation admits of the exposure being considerably shortened during photography with the Röntgen rays. Experiments, however, have shown that the platinic double salts possess a much greater luminosity and that the uranium ammonio-fluoride preparation is scarcely a serious competitor of the former.

VASCINÆ TARTARAS CRYSTALLISATA.—Tartrate of vasicine is an alkaloid extracted from the leaves of the East Indian Acanthacea named Adhatoda vasica. It forms colorless crystals which are but sparingly soluble in water and alcohol. The preparation decomposes if heated. Vasicine was first produced in 1888 by David Hooper, who also pointed out that vasicine produces toxic effects upon lower animals and vegetable organisms, such as spyrogyræ, paramecia, insects and frogs, while it had no effect upon warm-blooded animals. Vasicine appears therefore to be the active principle of the Adhatoda plant. It may be useful to investigate whether it possesses the antispasmodic and expectorating properties on account of which the Adhatoda plant is held in high regard by the Hindoos. This investigation should in particular be made with regard to the practical applicability of vasicine as an anti-asthmatic, since the leaves of Adhatoda vasica, if used after the fashion of stramonium cigarettes, have proved to be an excellent sedative in asthmatic attacks.

Curiosities in Food.

Turks shudder at the thought of eating oysters (says E. Bainbridge).

The Digger Indians of the Pacific Slope rejoiced in the great locust swarms of 1875 as a dispensation of the great spirit, and laid in a store of dried locust powder, sufficient to last for several years.

The French will eat frogs, snails, the diseased livers of geese, but draw the line at alligators. At the present time the flesh of horses is much in vogue.

Buckland declares that the taste of boa constrictor is good, being much like that of veal.

Quaso, the fermented cabbage-water of the Russians, is their popular tipple, which in taste is described as a mixture of stale fish and soap-suds; yet, next to beer, it has more votaries than any other beverage. A tallow candle washed down with a draught of quaso forms a meal that it would be hard to be thankful for.

In Canton and other Chinese cities, rats are sold at the rate of two dollars per dozen, and the hind quarters of dogs are hung up in butchers' shops alongside of mutton and lamb, but command a higher price. The edible bird's nest, probably made from species of Ulva-marina, or porphyra, of the Chinese is worth twice its weight in silver, the finest variety selling for as much as $30 per pound.

The octopus, or devil-fish, when boiled and then roasted, is eaten in Corsica, and esteemed as a delicacy.

In the Pacific Islands and West Indies, lizards' eggs are eaten and enjoyed; the natives of the Antilles eat alligators' eggs, and the eggs of the turtle are popular everywhere, though up to the commencement of the last century the turtle itself was eaten only by the poor of Jamaica.

The Cingalese eat the bees after robbing them of their honey.

Ants are eaten by various nations. In Brazil they are served with a resinous sauce, and in Africa they are stewed with fat or butter. The East Indians catch them in pits, and carefully wash them in handfuls like we wash raisins. In Siam a curry of ants' eggs forms a costly and dainty luxury.

Caterpillars and spiders are much esteemed by the African bushmen.

After having wound the silk from the cocoon, the Chinese eat the chrysalis of the silkworm.

Spiders are roasted and form a kind of dessert with the new Caledonians.

The Siberian people, called Tchuktchis, toast each other by drinking seal oil.

The Guachos, or mounted shepherds, are in the habit of hunting skunks for the sake of their flesh.

—Food and Sanitation.

An Indian Doctor of 1838.

It is hardly to be expected that the practice of medicine according to the North American Indian should boast of an extensive literature, and this fact makes such as occasionally comes to notice of exceptional interest. W. C. Deems, of Columbus, Ohio, is the owner of a small book written by Robert D. Foster, Botanic Physician, and printed for the author by Smith & Bevin, of Canton, Ohio, in 1838, which gives considerable insight into the medicinal agents employed by the pioneers, who were often treated to queer mixtures, in which the ideas of both white and red man had a part. The title of the book is "The North American Indian Doctor: or Nature's Method of Curing and Preventing Disease According to the Indians, Containing a Catechism of Anatomy and Physiology; also a Materia Medica of Indian Remedies or Vegetable Compounds." It is the "Receipts" and Materia Medica which are of most interest to the pharmacist, and a few selections from this portion of the book are reprinted.

For Asthma.

Take one ounce of lobelia seed, one ounce skunk cabbage root, one ounce garlic, half a pound seneca snakeroot, half a pound spignut, half a pound parsley root, one pound licorice root, and the liver of a sheep or calf or wolf, boil them all in one gallon of sweet wine and three gallons of rainwater till you reduce it one-half, then bottle for use; dose, half a tablespoonful three times each day one hour before eating. This has cured hundreds.

For Palsy.

First let the patient thoroughly cleanse the blood with burdock root, then take one ounce of umbil, called lady slipper, half pound of angle worms, half pint spirits of turpentine, fourth of a pound of lobelia seed, one ounce oil origanum, one ounce oil of spruce, one ounce oil cinnamon, four green frogs alive; put these all in a stone vessel, under a heap of rotten manure, well stopped up for ten days, then take it out and strain it, and rub the afflicted parts with it, and wrap the parts in flannel as warm as can be borne; let the patient drink plenty of sage, pennyroyal or horsemint tea, and I warrant them a speedy cure

For Liver Complaint.

Take equal parts of tomatoes, balmony, yellow poplar, spignut, saffron, cinnamon, nutmegs and queen of the meadow; make an extract of these and pill with unicorn; take three to five daily. Infallible.

For Epilepsy.

If you cut open the young ones of the swallows of the first nest you will find in their ventricle, two small stones, one of which is all of one color, and the other of several colors; before they touch ground, shut them up in a piece of goat or deer skin and tie them on the arm and neck; they will cure the patient of epilepsy.

To Purge the Brain.

Take some goat's milk and draw it in through your nose three or four times; this will entirely remove from the brain all obstruction.

For Fallen Palate.

If, through a great distillation of humors or fluxions the palate is fallen, cabbage juice applied on the head has the virtue to draw it up and put it again in its place.

For Cholera Morbus.

Toast or brown in a vessel, as you would coffee, four tablespoonfuls of oat meal, pour on it a pint of boiling water and add a little sugar to make it agreeable. For the information of the poorer classes of citizens, it is requisite to mention that oatmeal can be procured at any of the druggists' shops.

In the department of materia medica some wonderful virtues are ascribed to the most common plants. The doctor speaks of Hemp as follows: "This herb is good for something besides making halters of. The seed steeped is excellent for wind in the stomach; it opens obstructions of the gall and is good against all fluxes and is very good to kill the worms in either man or beast. The juice dropped into the ears kills the worms in them and draws forth ear-wigs. We are also informed that sage juice dropped in the ears kills the worms and is good to help the memory, and of golden rod, it is said, that "Venus owns the herb, and, it is said, it will restore beauty that is lost. It stays bleeding in any part of the body and is no less prevalent in all ruptures and bursting. A decoction to wash the mouth is good to fasten loose teeth.

At the end of the book the doctor enjoins upon every purchaser several rules, and one of these reads as follows: "That they keep this work within the limits of their own family, and lend to no one, as every person is able to buy and have one of his or her own."

Phenacetine Patent is Good.

Judge Lacombe, of the United States Circuit Court, decreed on Saturday that the letters patent issued to the Farbenfabriken vormals Friederich Bayer & Co., as assignee for an improvement in the manufacture of sulfonal, on Oct. 30, 1888, and also for an improvement in the manufacture of phenacetine on March 26, 1889, are good and valid. He therefore ordered that a perpetual injunction be issued restraining Henry Gill from making or selling the patented improvements and ordering the said Gill to pay over to the plaintiffs any profits accrued to him for infringements of the patents. This case attracted some attention a few months ago because Gill; who was a sort of drummer on commission for a Chambers street house dealing in suspensory bandages and sundries, said he proposed to fight the claims of the Farbenfabriken people and on precisely the same grounds as the Denver dealers are fighting. The result is that he has been beaten.

Anthony Gref, of Dickerson & Brown, the lawyers interested in defending the rights of the patentees, has gone to Detroit and Chicago to push certain smuggling cases in those cities. He will not return for a week or more.

——Certificates of registration were granted to the following applicants at the meeting of the Washington State Board of Pharmacy, held at Seattle, April 19 and 20. Registered Pharmacists—E. P. Vaughan, of Tacoma; H. W. Foster, of Portland, Ore.; W. H. Woodcock, of Seattle. Registered Assistants—F. A. Wilcoxen, of Seattle; E. H. Blair, of Elma; and J. J. Shannon, of Centralia. G. A. Todd, of Marathon, Ia., was given a certificate by reason of havong graduated from the Pharmacy Department of Highland Park College, at Des Moines, Ia. The next meeting of the Board will be held at Spokane, July 19 and 20.

QUESTION BOX

The object of this department is to furnish our subscribers with reliable and tried formulas and to discuss questions relating to practical pharmacy, prescription work, dispensing difficulties, etc. Requests for information are not acknowledged by mail and ANONYMOUS COMMUNICATIONS RECEIVE NO ATTENTION.

Spots on Cigar Wrappers

(A. & C.) See issues of this journal, July 9 and Aug. 6, 1896, pages 45 and 178, respectively, and April 15, 1897, page 453.

Solution Acid Phosphates for the Soda Fountain.

(G. C. D.) In the formula for solution acid phosphate for soda fountains, this journal, April 29, 1897, page 513, orthophosphoric acid and its salts (normal phosphates) are those intended to be used. Had mono or diabasic salts been intended such would have been indicated in the nomenclature.

Musty Odor to Tobacco.

(F. P. K.) The following is said to give a slightly sour or musty odor to tobacco: Boil in a covered boiler for three hours; best wine vinegar, 12 parts; water, 90 parts; honey, 1 part; raisins, 3 parts, and bay leaves ¼ part. Filter the solution. This quantity, when cool, is sufficient to treat 100 parts of tobacco.

Aqua Flavus.

(M. W. B.) "Flavus" means yellow, orange or golden colored, but just what is meant by "aqua flavus" in the formula for "Herculine," a soda drink (this journal, April 29, 1897), we are hardly prepared to say. This formula was furnished to Barker's "100 Mountain Formulas" by T. P. Fortune & Co., Memphis, Tenn. We suggest you communicate with Mr. Fortune, who doubtless will be pleased to furnish you with the desired information.

Library Paste.

(J. A. W.) See formulas in this journal, Nov. 12, 1896, page 633. Here is another:

Rice starch	2 ounces
Gelatin	6 drams
Water	16 fl. ounces
Oil of cloves	16 drops

Incorporate the starch powder with the water, add the gelatine and heat gently over a water bath until a jelly-like compound results.

Elixir Iron Pyrophosphate Quinine and Strychnine.

(J. E. W.) The elixir of iron pyrophosphate, quinine and strychnine you send us appears to be satisfactory, and we are unable to find any "white flakes of tannate of strychnine floating around in it." If tannic acid were present a dark, muddy colored precipitate of tannate of iron would be formed. As nothing of this character is found, it is quite evident there is no tannate of strychnine present. It may be that you failed to entirely dissolve the strychnine in a suitable solvent before adding it to the rest of the elixir, and, hence, allowed the crystals to float around in the preparation you dispensed. If such be the case, however, it is not apparent from the sample submitted.

Oil Ansenni.

(W. C. T.) In reply to your request for information regarding the identity of "oil ansenni" in the following prescription (this journal, May 6, 1897, page 542):

Oil gaultheria.
Lin. saponis.
Chloroform.
Oil ansenni.

C. H. Bowersox, Columbus, O., and J. W. Beckwith, Charleston, W. Va., suggest that "oleum anseris" or "adeps anserinus" (goose grease) is probably what is wanted. Whether this suggestion is correct, Mr. Beckwith thinks, may be determined by interrogating the customer. Geo. W. McDonald, commenting upon the same subject, asks if "ol. jecoris aselli" might not do for "oil ansenni?"

Dyeing Leather.

(J. C. M.) It is a difficult matter to dye a black leather any other color. To dye a tan or light colored leather the following may answer, though some experimenting is necessary to produce the desired results:

(1) Red.—Boil cochineal in a linen bag with water containing about 2 per cent. of aqua ammonia.

(2) Ordinary Red.—A decoction of saunders wood is used upon a feeble priming of alum, free from iron.

(3) Scarlet.—Boil 1 pound of logwood, 8 ounces of Brazil wood, 2 ounces of onion peels, some common salt, and alum, in 4 gallons of water.

(4) Dark Green.—Quercitron, 4 parts, logwood, 1 part, upon a strong priming of vitriol.

(5) Olive Green.—Boil fustic and some bruised gall nuts in water, and add solution of sulphate of iron until the desired tint is obtained.

Rock Candy Syrup.

(W. C. J.) asks for our opinion on rock candy syrup. A predilection for or against rock candy syrup is, in our opinion, more or less a matter of simple prejudice. There is good rock candy syrup and there is bad. The whole matter is reviewed in a very sensible, unbiased manner, in an article which appears in this journal, page 303, March 7, 1895. The conclusion of the author there cited was that a standard rock candy syrup should have a specific gravity of about 1.320 at 15° C. This allows of a trace of reducing syrup to as high as 2 per cent., and the sample should be either neutral or very slightly acid in reaction. As a rule, a syrup made from a good quality of granulated sugar and of sufficient degree of saturation is very satisfactory for soda fountain and other use. If our friend will read the article quoted, he will find his query very satisfactorily answered.

Perfume for Face Powder.

(J. E. G.) Face powders may be perfumed by triturating them with almost any of the perfume extracts, such as heliotrope, white rose, jockey club, etc. Here are two formulas, either of which is said to satisfactorily perfume face powders:

1.)	Vanilla	1½ drams
	Oil orange flower	10 drops
	Oil cherry laurel	5 drops
	Musk	¾ grain
	Benzoin	6 drams
	Alcohol	1 pint
2.)	Extract orange flower	1 ounce
	Extract white rose	1 quart
	Extract benzoin	1 ounce
	Extract vanilla	½ pint
	Extract civet	1 ounce
	Oil bitter almonds	3 minims

Causes of Appendicitis.

(W. J. F.) Physicians are far from agreeing as to the causes which produce an inflammation of the vermiform appendix. There are cases on record where foreign bodies, such as grape seeds, have been said to have been lodged in the appendix, while these statements have been denied by other writers. One of the most important papers that has been published on this subject is that by Dieulafoy (Year-book of Treatment). He first brings forward strong evidence to show that micro-organisms (especially the bacterium coli commune) which are usually harmless, acquire when shut up in a piece of gut closed at either end, extraordinarily virulent properties. Hence the inflammatory changes in a hernial sac. The first step in appendicitis is that the lumen of the appendix becomes in some way closed; then in the shut peripheral part the micro-organisms become virulent, inflammatory troubles supervene, and an attack of appendicitis is set up. Many causes, such as faecal concretion, etc., will at once suggest themselves to explain the occlusion of the canal of the appendix. The next point to which the author directs attention is the fact that appendicitis often runs in families, and he goes even further, however, and claims that these families are often affected with gout, arthritism, urinary and biliary gravel; and he concludes that arthritism, obesity, biliary lithiasis, gout, diabetes, lithiasis of the kidney and appendix, are various possible manifestations of the same diathesis.

If you wish to look into this subject at greater length we suggest that you consult some good medical library, and especially the works of surgeons who have made a specialty of the treatment of appendicitis.

Face Powder.

(Subscriber.) The Era Formulary gives these:

(1)	Venetian chalk	20	pounds
	Subnitrate bismuth	42	ounces
	Zinc white	42	ounces
	Oil lemon	1½	ounces
(2)	Talc	10	drams
	Wheat starch	1	dram
	Orris root	1	dram
	Oil bergamot	1	drop
(3)	Bismuth subnitrate	½	dram
	Purified talcum	1½	ounces
	Wheat starch	2	ounces
	Gypsum	3	ounces
	Triple extract fleur de lys	1	fl. dram

Mix intimately and pass through fine bolting cloth.

(4)	Talc (of the finest white grade)	38	pounds av.
	English precipitated chalk	25	pounds av.
	Powdered carbonate magnesia	10	pounds av.
	Oxy-chloride bismuth	7	pounds av.
	Cornstarch	20	pounds av.
	Acid salicylic (true)	43	grains
	Oil rose (pure)	5	fl. drams
	Heliotropine	½	ounce av.
	Oil bitter almonds	10	drops

Triturate oils, heliotropine, salicylic acid with bismuth thoroughly, mix with balance and sift through bolting cloth.

Pink or Flesh.

(5)	Take of the above	3¾	pounds av.
	Carmine, No. 40	1	dram

Triturate carmine with a small amount of the powder, gradually adding the balance, and sift thoroughly through bolting cloth.

Blonde.

(6)	Take of the "white" powder (No. 4 above)	1¾	pounds
	Carmine, No. 40	5	grains
	Burnt umber (in fine powder)	2	drams
	Raw sienna	2	drams

Proceed as with the "pink."

Calculation for Tincture Nux Vomica.

(J. R. S.) You will have no difficulty with the formula for tincture nux vomica, U. S. P., if you do not confuse the quantities given in the metric system with their equivalents in the English system. Use metric weights and measures altogether, making up the quantity (or half of it) called for by the formula. Transposing the weights and measures into the English system, the formula will read:

Extract nux vomica, dried at 100° C., 20 grams	309 grains
Alcohol, Water, each a sufficient quantity to make ....1,000 c. c.	33 fl. ounces. 390 minims

Then follow the formula as directed in the Pharmacopœia. To make one pint of tincture will require 146 grains of extract nux vomica, and alcohol and water in the proportion of 3 volumes of the former and 1 of the latter. As you will observe, tincture nux vomica is made by simply dissolving 2 per cent of the standardized extract in the mixture of alcohol and water in the proportions given.

Ung. Nasi.

(W. C. J.) We know of no specific formula for a preparation under the above title. However, the following have been found useful for application to the nostrils in cases of nasal catarrh and other difficulties:

1.)	Boric acid powd.	120 grains
	Menthol	60 grains
	Thymol	24 grains
	Eucalyptol	16 minims
	Bismuth subcarbonate	2 drams
	Ointment rose water	6 drams
	Petrolatum	5 drams

2.)	Thymol	3 grains
	Oil wintergreen	2 minims
	Bismuth subcarbonate	15 grains
	Petrolatum	1 ounce

In the first formula the menthol and thymol should be dissolved in the petrolatum which has previously been melted by the application of a gentle heat. The mixture is then allowed to solidify and the other ingredients added. Under the title "Unguen. nasoroseum" Hager gives the following:

3.)	Potassium iodide	1 gram
	Precipitated sulphur	2 grams
	Zinc oxide	3 grams
	Glycerin, Rose water, of each	2 grams
	Lanolin, anhydrous	5 grams
	Ointment zinc	20 grams

Presentation to T. P. Cook.

The formal opening of the Drug Club rooms in the Woodbridge Building, at William and John streets, New York, on Tuesday of last week, was signalized by the presentation to President Thomas P. Cook of a beautiful silver service. This was an entire surprise to Mr. Cook, having been arranged very quietly by A. A. Stilwell and others, who appreciated how much the club owes to Mr. Cook. There was a luncheon which was attended by pretty nearly everybody of note in the trade. While it was going on W. H. Andrews, of Pratt & Lambert, rose and made the following address to the president:

"A few days since a number of us were seated at the family table in the old quarters, and one of the gentlemen suggested that we give some testimonial to our friend, Mr. Cook. It, therefore, affords me great pleasure in asking you to turn from this generous feasting to the kindly play of sentiment, and through me, as your spokesman, to give expression to the one thought and the one feeling of friendship and appreciation of our president, Mr. Cook, by presenting to him these few pieces of silver for the efficient and honorable services which he has discharged with such fidelity and ability. It is due to his untiring efforts and those of our genial friends, Messrs. Peters, Young and others, that we to-day are able to enjoy our present surroundings. And, Mr. President, I speak not only for the older members, but also for the younger, who, loyal to all that has been, yet dwell not in the past, but in a progressive spirit step forward to meet the new occasions and the new duties. In their behalf I ask that you will please accept this as a slight token of our esteem, and we present it to you with our best wishes."

Mr. Cook showed some embarassment at first, the token being so unexpected, but he summoned his wits and said:

"I thank you most heartily for this beautiful gift, and I fully appreciate the sentiment that prompts it. It was very nice of you to do this, but I assure you that whatever I have been able to do toward the success of this club has only been made possible by the co-operation of a large number of friends. I certainly hope that we may have the continued co-operation of the old as well as that of the new members, to the end that we may broaden the field of usefulness of the Drug Club of New York City."

Another feature of the day was the presentation to the club of an oil painting by Bricher, entitled "On the Massachusetts Coast," measuring 40 by 18 inches. The donor was Theodore Weicker, of Merck & Company. It is said that over $1,000 was taken in during the day for eatables and drinkables.

THE PHARMACEUTICAL ERA

[*WEEKLY.*]

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EVERY MONDAY EVENING.

One of our esteemed subscribers in a recent letter writes as follows:

"My Era arrives every Monday, and that being my night on, I go carefully through the journal and mark on the margin of the pages the leading articles and advertisements of special interest to us. The next evening my clerk follows me through the copy for what I have marked, and writes to the advertisers as I have indicated. I can truly say that by this means we make the price of a year's subscription out of each weekly copy.

"I wonder if all of your subscribers appreciate the number of good things there are in each week's Era? When the old-time druggist received his drug journal he laid it aside for attention at some convenient time, but this plan will not work with a paper which comes in every week. For my part, I wonder how we ever got along without the weekly journal, for I know that the weekly visits of the Era are making me a better druggist and a better business man."

LOOK OUT FOR THEM.

It is reported to us that two young men are calling upon druggists in New Orleans and requesting permission to take photographs of the interiors of the stores. They claim to be representatives of the Era, sent to New Orleans to take photographs of all the principal stores.

The fellows are frauds. Look out for them.

PUBLISHERS' BULLETIN.

The attention of our readers is directed to the Publishers' Bulletin on the first page of the Trade Department.

Woman in Pharmacy.

A woman won one of the three prizes offered by the Georgia Pharmaceutical Association for the best practical papers read at the annual meeting. This would seem to dispose of the charge we have often heard that woman is not practical in pharmacy. But she is practical enough to win a prize for a practical paper on a practical subject, and what more can we ask. She is in pharmacy to stay, and the croakers must not croak too long, or, to use a slang expression, they'll be sure to croak in dead earnest in the early future.

One of our great newspapers has taken notice of the progress of woman in the profession of pharmacy, and as the result of some investigation finds that her success is not confined to this country, but has marked several European countries in the present decade. The carefulness, sympathy, delicate touch and quickness of vision of the sex fit them for the profession even better than men. In St. Petersburg they have founded an institution for women doctors and pharmacists, to which the Czar gave a contribution of 65,000 roubles. In April, the University of Vienna, for the first time in its history, conferred the imperial degree of doctor of medicine upon the Baroness Gabriele Possaner von Ereuthal, who has mastered both pharmacy and medicine in her brilliant professional career. In Germany, Fraulein Eva Bosse, daughter of the German Minister of Public Worship, passed in the spring examinations, finishing the pharmaceutical examinations along with two young women belonging to an ecclesiastical sisterhood. So even those who do not want woman in pharmacy must put up with her. But for us, we welcome her heartily.

A Derelict Board.

If a newspaper account is to be believed, there are some features connected with a poisoning case in one of our Southwestern States which places the Board of Pharmacy of that State in a very peculiar and blamable position. A young man of eighteen had appeared before the board for examination three times and failed each time. Influenced by the boy's earnest plea, the board is reported to have given him a certificate permitting him to put up prescriptions under the supervision of his employer. But the employer does not seem to have appreciated the necessity for this supervision. Hence it happened that the boy dispensed a prescription calling for a small dose of morphine; the customer died soon after taking it; the clerk disappeared, and all the evidence points to the commission of a big mistake in the amount of morphine put in the medicine. If this story is true, and a number of accounts agree upon the main facts, the Board of Pharmacy is both morally and legally responsible for the commission of a crime. The board's duty is to guard the people against incompetency in the handling of potent medicines, and it must not be moved from this duty by sentimental appeals for leniency. The fact that this boy had three times failed was the stronger proof that he was incompetent, and the sad result of this incompetence makes the board's action a very serious responsibility. If the druggist was in the habit of allowing this ill-trained, uneducated clerk to put up prescriptions without competent supervision, he is virtually guilty of the death occasioned thereby. Both board and druggist should be held accountable, not alone the boy; he did not know any better.

What Kind of Boy is Yours?

The child is father to the man, in the practice of pharmacy at any rate. The drug store boy is not the unimportant, insignificant individual we are too prone to consider him, but the material from which is to be moulded the future druggist. According to the character of his training will he be a good druggist or a bad druggist. As nothing is much worse than a bad druggist, it is well to inquire what kind we are making of the drug store boy. In a contemporary journal we find a contribution upon the boy that is so good, common-sense, instructive and thorough that we reprint it to call it to as wide a circle of readers as possible. Is the boy being trained in habits of neatness, diligence and application, or is he allowed to just grow up? The druggist has a greater duty here than just to pay the boy's poor wage and order him around. What kind of a boy am I training, is a question every employer can well consider.

Association Time.

This is association season, that portion of the year eagerly anticipated by many a druggist who knows from past experience what an enjoyable and profitable outing he may have in attendance at the annual meeting of his State association. We wish we had space to print a detailed account of the proceedings at each of these gatherings, for we believe in them. The druggist is a better druggist for them. Both reading and hearing papers, listening to and joining in trade discussions, running foot races, taking trolley car rides, all this business and pleasure brush the cobwebs from his brain, sharpen his wits, wake him up and refresh both mind and body. In a more serious view, the reforms and advancement in pharmacy are attendant upon association and organization. Here lies one of the duties of every druggist which he should not shirk.

"Inferior" Goods and Health Laws.

It will be remembered what trouble was occasioned in Ohio by the prosecution of dealers for selling goods below the "standard" of the pharmacopœia or other authority. The provision of the law was exact in its wording and permitted of no deviation from the standard. But in some chemicals especially, there is a large and entirely proper demand for goods of inferior quality, lesser strength, "off-grade," and where it is neither essential nor desirable that the highest grade be supplied. But Ohio law (and most others, too) took no cognizance of this fact, and some one had to suffer unjustly. As many carefully considered criticisms were founded upon this fact, it is interesting to note how this objection in pure food legislation may be overcome. Thus, the Louisiana Board of Health, in submitting a plan for enforcing the adulteration law and formulating rules and regulations for the guidance of the board, covers this very point, in defining adulteration by saying an article is adulterated, in the case of drugs. (1) If sold under or by a name recognized in the United States Pharmacopœia, it differs from the standard of strength, quality or purity laid down therein, unless the order calls for an inferior article to such standard, or unless such differences are made known, or so appear to the purchaser at the time of such sale; (2) If, when sold under or by a name not recognized by the United States Pharmacopœia, but which is found in some other pharmacopœia, or standard work on materia medica, it differs materially from the standard of strength, quality or purity laid down in such work; (3) If its strength varies from the professed standard under which it is sold.

"The term drug shall include all medicines for internal or external use, antiseptics, disinfectants and cosmetics."

Whether this provision for lower quality goods can be made to work effectively in practice is yet to be seen. Many will watch with interest the progress of the experiment.

The Era Course in Pharmacy.

The interest which has been aroused by the announcement of this course is evidence that there is need for something of the kind. There are thousands of young men so situated that any other method of gaining an education than home study is out of the question, whose time and money are not sufficient to permit attendance at a college. To these young men the Era Course in Pharmacy offers just what they want, being at once practical, thorough and economical. But its usefulness is not limited to this class. It will serve the drug clerks, the students in colleges and those intending to enter college; and graduates and experienced druggists will profit from the review it offers for the freshening of their knowledge. It is, in short, of importance to every one having any connection whatsoever with the practice of pharmacy.

This course is concisely outlined in the prospectus (yellow pages) elsewhere in this issue. It is a graded, systematic and comprehensive system of home study in pharmacy. Not only will the theoretical and scientific side of pharmacy receive ample consideration, but each subject will be treated with special regard to the actual necessities of the drug business as it is carried on to-day. This practical element will be one of its most valuable features. Then as to cost; this will be so small that it is within the means of any and all. But the great desideratum is, after all, thoroughness. To attain this, the lectures will be prepared by teachers who have made pharmaceutical education their life work, who are acquainted with the needs of students and who know what thoroughness demands and consists of.

The features here but roughly sketched are elaborated in detail in the prospectus. We believe in all earnestness that this course of study is well calculated to do much good, and confidently expect that the support it will receive will be in overflowing measure to substantiate this belief. We shall be happy to supply separate copies of the prospectus, matriculation blanks, and any desired information to all inquiring.

John F. Patton, York, Pa.—Your contemplated pharmaceutical lecture course, under the direction of Prof. J. H. Beal, certainly meets my hearty approval; anything that will aid the student in pharmacy is enterprised in a very admirable and worthy direction, for the man who handles and compounds medicines in the future must be well educated in his calling. The physician who has had a pharmaceutical course of training is a superior practitioner to the one not so equipped, and the thoroughly well educated pharmacist will always take precedence of the mere dealer in drugs. Unless a youth who aspires to be a pharmacist is well advanced in mathematics, pharmaceutical chemistry seems to present the most difficult problems. I am sure the lectures under the able direction of Prof. Beal will be of very great service to many a youth who is striving to perfect himself in a very worthy calling.

* * *

Dr. Henry R. Slack, La Grange, Ga.—I heartily approve your step in offering this course in pharmacy, and congratulate you in securing so competent a man as Professor Beal to conduct it. This will help those most in need of assistance, viz., the clerks who can't go to college.

* * *

J. A. Miller, Harrisburg, Pa.—Your plan for supplying your readers from week to week, especially the boys and young men who have recently entered the drug business, with a select course of lectures, prepared by competent educators, on the theory and practice of pharmacy, meets my hearty approval. It will give direction for study to all who are preparing for college, and will be very helpful to others who are deprived of college privileges.

Bowles Colgate.

Bowles Colgate is the senior member of the historic house of Colgate & Company, manufacturers of soaps and perfumes. He is a man of the old school, frank, kind-hearted, affable, a type which unhappily is becoming rare. Unlike the other members of the firm, he is not a Baptist, being a member of the Madison Avenue Methodist Church of New York, but he shows the family resemblance in his interest in religious work, all his time not devoted to his business and his family being spent in advancing the interests of the Methodist denomination. He was born in Brooklyn in 1846 and came to work with Colgate & Co. when he was fifteen years of age.

Mr. Colgate's special work in the house has been the sales department of the business. Probably few men in the trade are better posted than he concerning the credit of buyers. He resides at 50 East Fifty-seventh street and has a son and daughter, the son being associated with him in business. The only club of which he is a member is the Drug Club.

Colgate & Co. is probably the oldest soap house in the United States, having been founded in 1806, by William Colgate, who shortly afterward took his brother, Bowles, into partnership with him. Samuel Colgate, who died in Orange on April 23, was one of William Colgate's sons. The subject of this sketch is a grandson of the original Bowles Colgate, and is, therefore, a second cousin of Samuel Colgate, his father, Charles C. Colgate, having been Samuel Colgate's cousin. Samuel Colgate's sons, Richard M., Gilbert, Sidney M. and Austen Colgate, are also members of the firm.

Something is radically wrong in Pittsburg, the State of Pennsylvania for that matter, when drug clerks can sell morphine by the bottle without being called to account. This is what one Pittsburg clerk did. His excuse was that he knew the customer was an habitual user of the drug. But she took enough to kill her, all the same. Now, who is responsible? The clerk alone, the police department for not enforcing the poison law, or the Board of Pharmacy for the same failure in duty? A human life pays the penalty for the criminal fault of some one.

Correspondence.

We are pleased to publish here communications from our readers on topics of interest to the drug trade. Writers are requested to express their views as briefly as possible. Each article must be signed by its writer, but his name will not be published if so requested.

THE RED FLAG.

This journal had a few words to say a couple of weeks ago concerning the endeavor of the National Advertiser to induce newspapers to print certain paragraphs on "Substitution," thus hoping to assist proprietors and secure their good will and advertising patronage. That this campaign does not meet with universal favor among proprietors is evidenced by the following letter, published in the last issue of the National Advertiser.

POOR THINGS!

Boston, Mass., May 13, 1897.

Your plan for combating alleged substitution on the part of dealers does not commend itself to us. It seems to us that it is not likely to create a friendly or cordial relation between the manufacturers and the distributers of proprietary articles. Friendly and cordial relations between manufacturers and distributers are of prime importance to the success of both parties, and action on the side of either party which has a tendency to destroy such pleasant and useful relations cannot fail to result in lasting damage to both parties. Instead of endeavoring to crush and degrade the retail dealer in the eyes of the buying public, we should try to adopt methods which will strengthen the hands of the retail dealer and increase his popularity with the buying public, for his direct contact with customers places him in a position to help or hinder the sale of our goods to an extraordinary degree.

While we are anxious to avail ourselves of every legitimate means of reducing the evils of substitution, we regret that the predominating spirit of the plan which you propose seems likely to arouse the antagonism of the retail dealer, upon whom we depend so largely for the distribution of our goods. We thoroughly believe in aggressive action when necessary, but we have always regarded the retail druggist as our friend, and we are decidedly unwilling to assume towards him the overbearing and hostile attitude suggested by these paragraphs.

Yours truly, DOLIBER-GOODALE COMPANY.
Thomas Doliber, President and Treasurer.
By John Daboll, Private Secretary.

That all newspaper editors are not thorough supporters of the scheme is also apparent, as hear what one of them writes to Printer's Ink:

THE COUNTRY EDITOR'S SIDE.

ANOTHER PHASE OF SUBSTITUTION.

Office of
The Sullivan Review.
Largest Circulation in the County.
Fred Newell, Editor and Proprietor.
Dushore, Pa., May 14, 1897.

Editor of Printers' Ink:

I want to say a word in regard to this substitution business. Undoubtedly it is wrong for druggists and others to tell prospective customers that Jones' Sarsaparilla is "just as good" as Brown's. He should say: "It isn't any worse." But what I wanted to speak about particularly was the obligation of the editor, particularly the country editor, to attack the substituter. We will suppose that Mr. Pillslinger keeps a drug store and runs a half column advertisement (10½ inches) in the Weekly Bugle, paying therefor $50 a year. He also gets from $10 to $25 worth of job printing a year, pays a dollar a year for his own paper and sends two copies to friends in the West. That makes his yearly patronage foot up to $78. Now, the advertising department of Jones' Sarsaparilla Company run a five-inch electro in the Bugle, accompanied with two locals, to be mixed with pure reading matter. The electro has to appear at the top of column, next to and entirely alongside of pure reading matter on the local page. There is a string of conditions a yard long attached to the contract, the violation of any one of which means a fine that will have to be made up in increased insertions of the electro and reading notices. A copy of the Bugle is sent to the New York office of the company, and another to the town where the sarsaparilla is made. We will not mention the price to which the editor of the Bugle has been screwed down in accepting that contract. It is so low that he swears every time he thinks of it.

At the end of the year he sends in his bill, and after about six weeks receives a printed blank filled in to indicate that the issues of the Bugle dated Feb. 5, March 19 and 26, May 21, July 30, Oct. 8 and Dec. 3 have failed to reach the office of the advertising department of Jones' Sarsaparilla. The files are overhauled, the missing papers sent and the poor man awaits his check. After waiting only three weeks he receives a notice that the electro was inserted wrongly 15 times during the year. It is a lie, but he knows he can't get his money until he makes good the many insertions. Altogether it takes an average of 18 months to carry out the year's contract for the Jones Sarsaparilla Company. Then he gets the check, accompanied by a proposition for renewal at a reduced rate and a column and a half article on the substitution subject, which the Sarsaparilla people would esteem a great favor if he would insert in his editorial columns. Is it any wonder that he throws the whole envelope of trash into the waste basket and goes through his whole list of swear words from Dam to Beersheba? The above is a true statement of facts in nine cases out of ten, and Mr. Pillslinger's patronage is worth more for six months than is that of the Jones' Sarsaparilla Company for the eighteen months it takes to complete a yearly contract. Mr. Pillslinger may play it sharp with the Sarsaparilla people, but he pays his bills like a little man with the local paper. The Sarsaparilla folks want the earth with gravy on it when it comes to making a contract, and, as far as yours truly is concerned, he will stand by Pillslinger in preference to Jones' Sarsaparilla. Do you wonder at it? Yours truly,

FRED NEWELL.

Printers' Ink publishes the foregoing exactly as it has received it. It is given here for what it may be worth, all responsibility for the opinions it expresses being disclaimed.—Ed. Printers' Ink.

And here follows the expression of views of a retail druggist, a reader of the Era, upon the subject:

Palmyra, Mich., May 24, 1897.

To the Editor:

Your comments on the Red Flag system, which unprincipled advertisers have waved to the breeze, shows loyalty to the interests of the drug trade. But the carrying out of their project through the daily press reveals a degeneracy in journalistic ethics that would not have been possible in the days when the venality of the press was confined alone to politics. To-day anything that is paid for as an advertisement can find space, regardless of its character or tendency.

First, they publish at contract rates the preposterous claims of medicine proprietors, with all the gauzy statements made concerning their therapeutic properties. These constitute a tissue of improbable pathological theories concerning the functions of the human organism that might well disgust a primary class in physiology. Their columns are open night and day to advertisers of every shade of reputation, so long as they put copy in grammatical shape; and this is done under the time-honored claim that liberty of the press is the safeguard of the nation.

In order that they may see themselves as others see them, let us suppose their advertising clients had chosen as a vehicle of spite against the druggist the "sandwich man," and sent him through the country bearing the paragraphs quoted in the Era on his banner in plain view of the customers of those who are depended on to distribute proprietary remedies. Would the druggist consider this act as a compliment or an insult?

Or suppose further, they should choose to employ well dressed travelers to loiter around and inside drug stores, exchanging these and other insinuating comments in the hearing of waiting purchasers. How gracefully these flippant yet irrelevant sentences would fall from their lips upon the ears of willing and satisfied customers. Lives there a man so dead to all sense of decency who would not delight to see such offensive interlopers kicked across a 16-foot pavement into the arms of a passing scorcher even at the expense of valuable shoe leather?

And wherein is the difference between sending men to insult the druggist to his face under a hypocritical pretense of disinterested regard for public welfare, and the printed page (bearing perhaps the advertisement of the dealer at highest local rates,) and at the bottom of every other column an unprovoked insinuation as to his personal honesty? If such anonymous paragraphs are to be substituted for legitimate news and reading matter to gratify the malice of one class against another, no man's reputation is safe from covert assault so long as money talks.

Because here and there may be found a dealer in specialties who has the faculty of hypnotizing a customer into buying a different article from the one he first thought he wanted, the whole guild of honorable pharmacists are to be assailed with the venom of advertiser's gall to line the coffers of a press that will sell principle and space to the highest bidder for spot cash. Furthermore the few proprietors who stand behind this new enterprise masquerading in the guise of reformers of commercial methods, may well be compared to the Spanish Weyler, who trains his guns upon non-combatants, and glorifies himself in the thought that he has gained a decisive victory over active insurgents.

PETER C. MEEK.

Abuse of Dispensary Privileges.

Philadelphia, Pa., May 20, 1897.

To the Editor:

In your issue of May 20, 1897, page 609, is a clipping from one of the daily papers of my article as read before our County Medical Society. Enclosed you will find a copy of my article. Instead of there being only eight hospital dispensaries there are over forty, and during the past year over 500,000 free visits were made to eight of them.

The dispensaries are ruining the physicians and druggists, as neither can compete with them. I propose to use my best efforts to have the abuse corrected, and trust the druggists will do the same.

My motto is "To live and let live"; therefore I favor the druggist when I have an opportunity. Yours very truly,

C. F. SOUDER.

To the Homoeopathic Medical Society of Philadelphia:

The Board of Censors of this society has issued an appeal to our physicians, requesting them not to become connected with the new business organizations. It appears to me the subject should be investigated further and learn why so many have become associated with them, as we well know that no one would be willing to make visits for such a small sum unless necessity compelled him to do so.

Is not the principal cause due, directly or indirectly, to the forty hospital dispensaries in this city, where those who are able to pay, can and do receive free treatment? The treatment cards read distinctly "For the treatment of the poor only." Why is the rule not enforced? If it were enforced, would it not solve the problem that is now driving many to acts of unprofessionalism and seriously threatening to ruin the practice of medicine?

During the past year over 500,000 free visits were made to eight dispensaries. The number of those visits that ought not to have been "charity" cannot be told; but a few visits to the dispensaries will convince any one that the percentage is large. It is almost needless to attempt to prove that the abuse is real and not imaginary, but a few cases from personal experience will be mentioned.

The proprietor of a large and prosperous business establishment, who was dressed in the best and latest fashion and wore a valuable diamond ring and stud, applied for treatment. When removing the treatment card from his pocket, he unintentionally pulled out a large sum of money. On being asked if he were not able to pay a physician, he replied: "Yes, but what is the use of my paying a doctor when I can come here and get treated for nothing?"

Another gentleman, who wears a large diamond stud and boasts of owning a $1,000 pleasure yacht, applies for treatment regularly and always requests to be given attention before any one else.

A lady asked me one day if her husband was being treated at the dispensary; on receiving an affirmative answer, she replied: "Do you know it's an outrage for him to go there, as he owns over $90,000 worth of government bonds, but is too mean to pay a doctor?"

The people have so long been accustomed to look upon the hospital dispensaries as free to all, that they do not realize the position they place themselves in when receiving treatment from such institutions. Even the physicians who bring the subject before the public will be looked upon as selfish, uncharitable and unchristianlike; but is not the abuse growing so general and widespread and so disastrous in its effects, that it would be suicidal for the profession to remain longer silent?

Would not those who are charitably disposed give more liberally and willingly to the hospitals if efforts were made to prevent the unworthy from receiving the benefits, and would not the same amount of money accomplish much more good? Do not the unworthy crowd out the deserving? And is it not an injustice to the contributors to the support of such hospitals when the unworthy receive the benefits?

Would not the poor and humanity in general be benefited by having the abuse corrected as well as assuring the physicians they are not injuring their own and others' prospects of earning an honest living when giving their services free to the unfortunate?

Is it "charity" to give free treatment at the dispensaries to those who are able to pay? But instead does it not pauperize and demoralize those receiving such treatment and encourage pauperism?

Is there any reason why physicians should give their services free to such any more than in any other profession or business? And when they do so, is it not an injustice to themselves and to every other physician?

If the college hospitals do not protect their graduates, will the physicians continue to refrain from resorting to methods that are now considered unprofessional?

Is it not time that this society use its influence to correct the evils that are now demoralizing the practice of medicine and driving young men to enter other professions that offer greater inducements?

C. FLETCHER SOUDER, M. D.

ETHICS IN PHARMACY.

By Prof. JOHN URI LLOYD.

In our ranks we have two classes of apothecaries. One class believes in purchasing supplies and devoting time and thought to the distributing of medicines as purchased. This section of our people feel that personal attention to the sale of goods is most congenial to their taste. The second class believe in experimentation, scientific study, laboratory work and pharmaceutical manipulation. They are as a rule at a disadvantage in commercial matters as compared with their business competitors. The returns from their labor must come largely from the improvements they make in processes and discoveries in science. In my opinion, these men have not been encouraged as they should have been.

It is probably useless for me to say anything in print concerning the most vital issue connected with the welfare of the scientifically inclined apothecary, but I have no objection to expressing my views again. Useless because of the fact that my opinions are not only already well known, but because the majority of those who write on this subject and also who dominate the opinions of others are opposed to my principles.

I believe that as long as we do not have reciprocity elsewhere, the cry of socialism for the scientific pharmacist is a burning wrong to him who studies, thinks and works in pharmacy. Possibly the same pleading might be extended to the salaried professor who is paid for what he teaches, but, as I see the matter, a distinction should be drawn between him and the man who gets no personal return from instruction that enriches others. It seems to me that this distinction has never been drawn. The ethics governing men in salaried or professional positions have been applied to persons situated very differently. I do not know how I can make my words any plainer. Until a corresponding return is made to the public by other inventors, until others give the results of their brain work to competitors both at home and in Europe, I am not in favor of making American pharmacists do so. When a discovery is made in pharmacal lines that by its publication either in the patent office or in public print will not only take from the discoverer the monetary return that belongs to him that invents, but will put the profit of the inventor into the hands of competitors who have no right to this property, I am opposed to a code of ethics that advocates the wrong, notwithstanding the authority that framed the code. The reverse may be true when a rule of action is applied to the professional man, for every discovery heralded abroad adds to his credit, makes him the more conspicuous, increases his value as a teacher and redounds to the interests of the institution with which he is connected. To herald his discoveries is to serve his best interests.

Those in trade who make discoveries, by the application of science and skill that benefit mankind, should, in my opinion, either receive a personal return in the way of royalties from some responsible manufacturer, or should profit directly by their discoveries. If the discovery is of great public value, the franchise should be paid for by the public if it is turned over to the public. It is simply a case of dollars and cents and not one of sentimentality. The dollars of the millionaire inventor, the opulent merchant, the salaried professional man should contribute to the poor pharmacist if his all which is usually brain work in close business lines is to be dropped into their pockets.

In some cases the patent laws will give the inventor full protection, in others they will not do this, but quite the contrary. In some cases the trade-mark or copyright laws afford better protection, but these latter schemes will not prevent others from entering the field with the same or similar preparations under other names. Neither should they do so.

I am well aware of the fact that I stand nearly alone in my views in this direction, and that I have never been on the popular side. However, this fact does not concern me in the least since I believe that I am right. Some of my closest friends feel now and have always felt that I am a heretic in trade ethics, but I have seen nothing in their arguments or the results of their methods to lead me to believe that I am the sophist. Indeed, I have every reason to feel that in time to come (a long way perhaps in the future) the spirit of our code makers will rise to the fact that a great wrong has been done American chemists and American pharmacists (and largely to the advantage of Europeans) by this unqualified opposition to the personal return of him who spends his life in behalf of real pharmacy. "The laborer is worthy of his hire," and I fail to recognize any argument that excludes the scientific pharmacist from the field of labor, or any ethical axiom that should take from him his just return.

In my opinion, the burning question that the sincere advocate of just pharmacal ethics will have to meet when at last he realizes that discoveries in pharmacy should be recognized in both law and ethics, is that of unfounded pretensions in those who claim to have made pharmacal discoveries. The question will be how to differentiate between that which is possessed of merit and impositions. As conditions are now, however, the medical profession and the public are neither spared the extravagant claims of impostors nor guided in the direction of merit. The industrious young man who devotes his all to the acquirement of an education, is placed by the side of the impostor if he protects his own interests and the public.

I must not neglect to say that I do not overlook the noble ethical works of some persons, who in theory stand quite in the clouds. They believe that the returns that come from pharmacal advancement of the individual must be free to all business men and that he who evolves in pharmacy must in public charity give the results of his labors to his business competitors, even though they are rich and powerful enough to crush him. According to these men it is wrong for a struggling pharmacist to keep a process private that he has acquired by long and expensive experimentation, and wrong for a manufacturing firm to pay him a royalty on his discovery. In the minds of these persons, and I have some very dear friends in their ranks, the pharmacist who takes advantage of the trade-mark, copyright or patent law, is unspeakably guilty. I have heard this argument, even from professional men who copyright every book they issue.

For myself, I say now as I have always said, I agree in that charity is a duty, and that it is more blessed to give than to receive. But I have felt it a duty to provide for my family, to acquire as much of an education as is possible, to try and guard against poverty in my declining years, to leave a substantial testimonial of regard to my fellow-pharmacists who wish to study and work in real pharmacy, and I could not have done either of these had I permitted myself to be misled or to be drawn away from what I firmly believe is the right. The right of personal returns to individual investigations, be it in pharmacy or in any other line of science advancement, is a birthright and he who uses the legal methods for self-protection in discoveries is doing no more than justice toward himself and his family, regardless of sentimental codes of ethics that strike at the use of these privileges instead of their abuse.

These being my convictions on the most vital question that concerns the pharmacist, I cannot but favor the application of the copyright, trade-mark and patent laws of our country in the direction of discoveries in pharmacy. I neither understand why that franchise should be left undisturbed in the hands of outsiders who reflect no credit on our art, nor why those in pharmacy who pay their money for education, investigate, make discoveries and protect their rights by the law that governs all other classes of business, should be classed with pretenders.

I believe that we have in our ranks a regiment of worthy men facing lost opportunities, lost because of the fact that pharmacy ethics of the past offered no inducement for the financial self-protection of meritorious workers. I believe that the blanket opposition our ethical leaders have made to the protection of meritorious discoveries in pharmacy has not only failed to elevate pharmacy, but has largely contributed to the conspicuity of imposters. At least, this inflexible code has not prevented an evil that oppresses Americans and enriches Europeans who allow no sentimental code to hold them back. Alas, I see no hope of overcoming the evil while our ethical leaders follow the footsteps of their fathers and neither make an effort to encourage those who have something of value to offer the medical profession, nor attempt to distinguish between the true student in pharmacy and the pretender.

Believe me, my dear sir, I am fully aware of the fact that I stand alone in these views, and yet I prefer to be satisfied with myself rather than be with the majority. I prefer to give my charities according to my own judgment and to do business according to the laws of my country rather than give my rights to persons in whom I have no concern, in accordance with the views of men long since dead, none of whom have ever contended with problems that surround pharmacists now, at least, such as have confronted me. And, I will finally add that while I believe most of these extremely ethical men have been conscientious, I may be allowed to say that their bunched opinions did not in my single opinion make them right in days gone by, and neither do they make them right at present. I believe their orthodox views have never served the bests interests of those unfortunate men who must make a living by scientific pharmacy; neither have they prevented impositions in medicine. Under this code the pharmacists' life has reached present conditions which might be worse, but not much.

I will close by saying that in this letter I refer only to the ethics that govern the relationship between pharmacists and physicians. I have no experience in the direction of remedies designed for popular medication, or in the making of mixtures of well known drugs (secret mixtures) under fanciful titles for self-medication, and would not presume to express an opinion concerning that phase of the question.

It is but proper that as my views in this direction are heretically irregular, I should not involve others in the least. I therefore write in the first person believing that I alone see this matter in the light presented, and that I am the minority of one. (Pharm. Review.)

A Legal Prescription?

The Appellate Court at Indianapolis, Ind., recently rendered a decision of great interest to druggists. A. H. Caldwell, a Martinsville druggist, sold a quart of whiskey on a physician' prescription reading "Whiskey, one quart, for medical use," and was fined for selling intoxicating liquor on Sunday. The court held that the presentation of a prescription that does not request that the sale be made on Sunday, nor to whom it shall be sold, nor the manner in which the liquor shall be used, is not authority for selling on Sunday, and that the burden of proof is on the druggist to show that the liquor was used for medical purposes.

ON CHEMICAL ENERGY.[*]

By Dr. W. OSTWALD, of the University of Leipzig.

During the scientific development of chemistry, the hypotheses which have served as a primary foundation have always been borrowed from a prominent sister science. At the time of the most rapid development of mechanics as founded by Galileo and advanced by his pupils and successors, chemistry was mechanical; the solvent action of acids upon metals was explained by assuming that the former possessed points and edges by means of which they disintegrated the latter; bodies which combine were supposed to have hooks by means of which they attached themselves to each other. When Newton based his theory of astronomical movements upon the assumption of a force acting inversely as the square of the distance, chemistry shortly appropriated this idea and traced all processes to the attraction and repulsion of particles. It is, therefore, not surprising that the phenomena of the Voltaic pile (which later proved to be so intimately connected with chemical changes), were at once utilized to serve as a foundation for a theory of chemical processes. These theories, especially that of Berzelius, have prevailed a long time, but finally have proved themselves just as insufficient to represent chemical phenomena as the mechanical and the attraction theory.

Thus the theory of chemical combinations is to-day a strange and contradictory conglomerate of the fossil constituents of earlier theories. The rudiments of the theory of attractions still play the most important role, while there is also considerable discussion about positive and negative elements, i. e., the residues of the electro-chemical theory, and in most recent times we see the long forgotten mechanical conceptions again stepping to the front in stereo-chemistry and being accepted by many as a new step in the progress of science.

In such times it is of great value on the one hand to recall the historical development and the evanescence of theories; on the other hand to find in the older theories that which is useful and correct, so as to obtain sound building material for a new theory.

Especially are we forced to conclude from the fate of past theories, that chemical phenomena must be explained by their own interrelations; that is, must be logically arranged. The use of analogies from other fields of natural science has indeed often led to suppositions which for the moment seem satisfactory; on trial, however, such analogies have always proved themselves more a drawback than a help, since they hindered the unbiased comprehension of facts, and they could not (or will not in the future) be cast aside without a great struggle and considerable sacrifice of time and labor.

It is scarcely needful at present, to prove that the several provinces of quantitative science possess in a single conception both the principle which distinguishes them and that common principle which unites them, namely, the conception of energy. Mechanical energy is distinct from thermal; similarly, chemical energy is distinct from electrical; and in each province progress can only be made by studying the various properties which the form of energy under examination possesses.

At the same time, however, the laws which determine the correlation and conservation of energy constitute the only bond which unites the various fields. If heat could not be changed into mechanical energy, and chemical into electrical, these provinces would stand distinct and isolated from each other; and neither thermodynamics nor electro-chemistry would be possible. This shows that progress in the scientific conception of chemical phenomena depends upon primarily determining the several properties of chemical energy as such, and then its relation to other forms of energy; this done, we will be able to cope in a scientific manner with each chemical process, no matter whether it leads to other chemical changes or causes the appearance or destruction of other forms of energy.

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[*] Read before the World's Congress of Chemists.

The knowledge of the laws of chemical energy is not only scientifically but also practically of the greatest interest. All energy which is employed in accomplishing the various purposes of industry is derived from chemical sources, the combustion of fuel. Besides each step that we take, every word that we speak, in fact every thought formulated by our brain leads to sources of chemical energy; animals and plants throughout their whole existence are based primarily upon chemical energy and its laws, and the ultimate problems of biology are in every respect chemical.

All forms of energy have this in common, that they may be resolved into two factors, both of which have definite properties. The one, which we call intensity, determines whether the energy may remain at rest, or must undergo an exchange. Thus, for instance, the factor of intensity for heat is temperature, since we know that no two bodies can remain at rest with reference to their heat only when their temperatures are equal. The second factor we call capacity; it determines how much energy at a given intensity is present in the object under consideration. With heat, for instance, this is called heat capacity.

What now are the factors of chemical energy? If we had a measure for its factor of intensity, as the thermometer is the measure of the intensity of heat, we would be able to determine for each substance with reference to another whether it could react with the latter or not, just as the thermometer shows us whether or no heat can be transmitted from one body to another. Our answer is that this question has not been completely solved, but that for many phenomena we already possess a chemometer, as we might call the instrument—in analogy to the thermometer.

In order, however, to be able to explain the theory of the chemometer, the factors of chemical energy must first be more precisely determined. The factor of capacity is in this case most easily discovered. The chemical energy which is present under given circumstances is proportional to the weight or mass of the substances involved. Hence we buy and sell chemical energy according to weight. This becomes more clear from the following consideration: When we buy coal we do not consider the carbon present, but rather the chemical energy, since in the use of the fuel we allow the carbon to escape quietly through the chimney as carbon dioxide without making any effort to retain it; that, however, which we husband with the greatest care is the chemical energy of the coal, obtained as heat. I have stated with due consideration that the factor of capacity of chemical energy is proportional to the mass; yet it is not mass, since this conception belongs solely to mechanics. It is, therefore, more correct to say "atomic mass" instead of "atomic weight"; since in this case the degree of chemical capacity is concerned which is proportioned to both weight and mass, without being one or the other.

The germ "degree of intensity" of chemical energy has something in common with the conception which has become familiar in the field of chemistry under the term of "chemical affinity," and more to denote that field in which a more accurate knowledge was especially desirable than to combine by such a word sufficiently definite ideas. The word was then just as the name of a future street stands on a signboard in the outskirts of a city, in a waste field; tents and barracks have been erected from time to time only to be deserted again; only in most recent times solid buildings and permanent settlements have found a place on this site, and soon a new section of the city will be created there, whose importance threatens to throw the older portions of the city in the shade.

J. Willard Gibbs called the degree of intensity of chemical energy the potential; analogous to the degree of intensity of electrical energy, which is called the electrical potential. So, to avoid the vagueness of the term affinity, we will make use of the term chemical potential, or in brief potential.

Now it follows from the definition of the degree of intensity, that two substances with like potential cannot act on each other; and, conversely, that when two substances act on each other, their potential must be different.

The general law which can be regarded as expressive of the Second Theorem holds also for the chemical potential, namely: Two potentials which individually are equal to a third are equal to each other. This proposition seems quite self-evident, and, therefore, equally meaningless. Yet we can draw from it conclusions that are very far reaching. It says that two bodies or groups of bodies that are in equilibrium with each other can mutually replace each other at pleasure towards a third system in every reaction in which this third system (towards which equilibrium has been established) can react. Thus for example, every soluble body can be replaced by its saturated solution, every liquid by its saturated vapor, every solid body at its fusing point by the melted body without causing any alteration in the equilibrium depending upon the former. Among other things this shows that while the heat of solution, fusion, and evaporation change the evolution of heat during a chemical process, they do not affect the equilibrium. The thermal theory of affinity, which is even to-day championed by Berthelot and others, is by this circumstance proved to be quite untenable.

It is natural in the case of such a far-reaching proposition to require proofs. This proof is found in the fact that it is impossible to create a perpetuum mobile. To have a perpetuum mobile it is not necessary to create energy from nothing, but only to transform potential energy into kinetic. If it were, for instance, possible to transform the constant heat which is present in enormous quantities in the ocean into work which then could change back into heat, we would require no more coal to propel our steamships, since all the work which we required for their propulsion would be transformed into heat by friction and could return to the ocean in unchanged amounts. Such a perpetuum mobile will be instantly possible when two substances which individually are in equilibrium with a third are not in equilibrium with each other. If we assume that a substance, A, when in contact with a large body, B (the ocean), assumes a temperature which is different from that imparted to a body, B, simultaneously in contact and equilibrium with the ocean, we would cause a transmission of heat between A and B which would be capable of driving a machine. This proof is equally true for every other form of equilibrium and every form of energy, and thus we also prove our chemical proposition.

When we have thus recognized the conditions under which energy is in equilibrium or at rest, we can directly reason that energy cannot be at rest when its potentials are different. A process must then take place by means of which they become equal. This is the most common phenomenon with which we are acquainted; everything which takes place is based in the last instance upon an equalization of energies of different potentials.

Since, however, energy, as is a fact, has a never ceasing tendency to equalize itself, the question arises why it has not done so long ago during the many thousands of years which our system of worlds has existed. We continually see differences of potential existing in nature—compressed air, galvanic elements; all these contain stores of energy which are ever ready to act, and must, therefore, be unequal. Likewise the fossil fuels and the sulphides of the metals are able in conjunction with the oxygen of the air to bring forth large amounts of energy during their interaction, and cannot, therefore, be in equilibrium. Aside from the tendency for equalization, which is peculiar to energy, other forces are, therefore, active in nature which hinder or detain this and an accurate understanding of these natural phenomena can only be obtained when these opposing and detaining causes are known.

For mechanical and electrical energy such hindrances can be easily created. A spring may be kept wound by a weight; two electrically charged bodies, which tend to approach each other, can be kept from attaining their equilibrium by the dielectric resistance of an interposed medium. All these hindrances, however, have but this explanation, that the differences of energy present are compensated by the use of other energies, so that their equalization is prevented; at the same time we can prove that, according to the method employed, large quantities of one form of energy of any magnitude can be compensated by small quantities of another form of energy, for by means of a small switch, enormous currents of electricity can be interrupted and closed at will.

In the case of chemical energy we are, however, very often unable to prove such compensations by the application of other energies. When a piece of wood is exposed to the air, it would be in accordance with the general tendency to equalize the energy present if combustion took place and the wood combined with the oxygen of the air. The same would apply to organized bodies. Our body consists of combustible substances; and, in accordance with the chemical affinities present, it should combine with the oxygen of the air and burn without cessation. Why is it not consumed?

If we should attempt to answer this question we should soon become entangled in inexplicable contradictions. We cannot ask: Why is our body not consumed since it does actually burn. It continually takes up oxygen and gives off carbon dioxide. The same answer applies to other chemical phenomena. A stick of sulphur exposed to the air seems unchanged, but it is only apparently so. In reality it is oxidized; slowly, however, and so slowly that we could not notice it in weeks or months. If the process were, however, continued for years or decades of years, the oxidation could be measured. The rapidity of reaction is clearly proportioned to the surface. If we take finely powdered sulphur, flower or milk of sulphur, whose total surface is much greater, we can prove the formation of sulphuric acid in hours and days.

What has here been stated for a few cases is a general truth. In every case where different substances which could act upon one another are in contact without having, practically speaking, any apparent action upon each other, we can bring the requirements of the teachings of energy into unison with the actual conditions by actually ascribing to the substances an action which is, however, so slow that it lies beyond the possibilities of measurement.

We have here the means of entering upon one of the most important and mysterious problems, namely, the search after the chemical activity of organized bodies. For, as all the activity of organisms depends upon changes in their chemical energy, all knowedge in this case depends upon a correct elucidation of the character of the chemical changes. If we can understand how the chemical processes of combustion, to which all physiological sources of energy finally lead, can be so regulated that they are able at any moment to adapt themselves to the ever changing requirements of the organism, we have taken a step in every respect most important in the knowledge of life.

Let us take, for instance, a mixture of oxygen and hydrogen. Under ordinary circumstances we can preserve this mixture for a long time without the formation of a measurable amount of water. If, however, we place a piece of platinum sponge into it, the formation of water immediately begins; and it is as suddenly terminated when we remove the sponge. The platinum sponge has, moreover, undergone no change, and is able to exert this action for an unbounded space of time.

At first it seems as if we had here the first proposition of our later natural science; to rudely dispute "causa arguat effectuum," since we have here a cause which can bring forth large and extended effects at pleasure without becoming exhausted. If we ask, however, what this proposition means by cause and effect we find it to be degrees of energy. No energy of any kind can be created without the consumption of an equal amount of energy, and no difference in the potential of energies can be called forth without the simultaneous disappearance of equivalent differences in the potential of other energies. The truth of these propositions is not cast in doubt by the experiment with the mixture of oxygen and hydrogen, since the heat of combustion remains the same both when combination is effected by an electric spark and when it is brought about at the ordinary temperature by means of a platinum sponge. While, therefore, the law of cause, clothed in the form of a principle of energy, regulates the final result of the action in an unchangeable manner, the time during which this action takes place remains absolutely independent of this principle, and we have side by side with the absolute necessity of this law of cause the freedom with reference to the time during which it exerts its influence. Therefore we see that all possible phenomena which, originating from the same substances, reach the same products, arrive at these with a very different rapidity. The object to be arrived at is unchangeable; whether it is, however, to be accomplished in a second or in several thousand years is a circumstance over which we have full control.

The name "catalytic bodies" has been given to substances which cause chemical reactions without experiencing any change themselves. We will now change this definition so as to read thus: Catalytic substances are those which modify the rapidity of a definite chemical reaction without changing their own content of energy. To place a catalytic substance into the reacting bodies, and to remove it, requires theoretically no work. This proves that within the strict province of the law of energy there still remains room for the greatest variation in the temporal extent of the phenomena.

This peculiar circumstance has its foundation in the fact that in the expression of most degrees of energy time is not mentioned, and that, therefore, the equation of energy does not determine the extent of time involved in the phenomena.

One exception is made in the case of kinetic energy which depends upon the rapidity. What has been stated above does not, therefore, apply to this form of energy. Upon what the action of catalytic substances depends is still a mystery, the solution of which is the more difficult, since it can only be explained by means of new principles, which are beyond the law of energy. At present we must be satisfied with the knowledge that it is a fact, and must seek to become acquainted with the laws involved. A beginning has already been made; from a large number of various investigations it has been found that many chemical reactions, which usually take place very slowly, are hastened by the presence of free acids; or, to speak in the language of the modern theories, by the presence of free hydrogen-ions, and that this action is proportioned to the concentration of the latter. The greatest variety of phenomena have been examined in this respect, partly by me, partly by my pupils, and I have, as yet, found no case where this statement did not apply. Free hydrogen-ions are, therefore, without doubt exceedingly active catalysators of a general character.

At the same time numberless specific catalysators exist which act only upon certain phenomena. These are the ferments, organized and unorganized. These also are unable to do more than to change the rapidity of certain reactions in one or the other respect, and all attempts to explain their action must be based upon this their sole property. The laws which they obey seem to be of an extremely complicated nature, especially with the more complex constituted ferments; this is probably due to the fact that they undergo a change themselves while influencing a certain chemical reaction.

I need not show in an extended manner that the wonderful action of living organisms can be traced to a regular impulse upon the chemical processes which take place among their constituents in accordance with general chemical laws, and that these again may be traced to the action of catalytic substances. If the rapidity of reaction in a muscle is hastened, which may be regulated from a central organ, this muscle will accomplish a corresponding amount of work. When, however, the supply of energy is exhausted, the influence of a catalysator cannot force it to any further manifestations. The same is true for all other activities of organisms.

I cannot assume to have made clear the mystery of life in the previous pages, but I believe I have solved a more apparent problem, namely, to show that the science which is seemingly abstract and foreign to actual life, and which has developed during the last years under the name of physical chemistry, is a science of the highest real importance. If it will be possible for this science to throw light upon that most difficult of all the problems of nature, the mystery of life, how much easier will it be to explain by means of the new principles the by far much easier problems of technical chemistry which have not been solved so far. It is quite natural and self-implied, but we must nevertheless repeat again and again that "The more perfect the theoretical evolution of the sciences becomes, the greater will be the scope of their explanations and at the same time the greater their practical importance."

PETROLEUM AND ITS PRODUCTS; THEIR PHARMACEUTICAL USES.

The earlier history of petroleum, and of the solid "bitumen" produced by its spontaneous evaporation and oxidation as it oozes from the strata containing it, refers almost entirely to the medicinal use to which it was put. The value of petroleum as an illuminant and heating agent was more or less known, but it appears to have been entirely overshadowed by its curative powers as an ointment for wounds and skin diseases, and, to a slight extent, as a medicine for internal use. (Pharm. Journal.)

Writing at the close of the thirteenth century, Marco Polo (see "The Book of Ser Marco Polo, The Venetian," London, 1871) stated that the oil of Baku was "used to anoint camels that have the mange," and that "people came vast distances to fetch it," and Jonas Hanway, in his "Historical Account of the British Trade over the Caspian Sea" (London, 1754), stated that the Russians drank the thinner petroleum as a cordial and medicine. The solid bitumen found floating on the Red Sea was early esteemed for medicinal use. Diodorus, a contemporary of Julius Cæsar, stated that it was employed in Egypt for embalming purposes, and in the "Complete Chymical Dispensatory" of Dr. John Schröder (see English translation by Rowland, 1669), we are told that the "Jewish is the best that comes from the Mare Mortuum."

Among the liquid varieties of petroleum employed before the present century, the almost colorless variety employed in Persia was most esteemed, and Boerhaave (Shaw's Translation, 1753) states that the "oleum terræ" of India was in his time so scarce as to be "kept by the Princes of Asia for their own use."

In Bavaria, the petroleum from the Tegern Sea was used as early as 1436 as an ointment, under the name "St. Quirinus' oil," while in Italy, the oil of Modena was similarly employed in the seventeenth century. In Pennsylvania and New York, petroleum was formerly used by the Indians as "Seneca Oil," and about the year 1849, "American Oil," obtained by roughly distilling petroleum, was sold by S. M. Kier, of Tarentum, on a large scale, for external application. It is stated that Mr. Kier's operations were to a great extent the cause of the earliest attempts at the drilling of artesian wells for petroleum.

In England, petroleum, under such various names as petroleum, naphtha, bitumen, oleum terræ, earth balsam, pisselaeum, pissasphaltum, mumia, etc., was used quite as extensively as in other countries, but the price of the colorless and light colored oil was so great that the bulk of that used is stated in James' "Medical Dictionary" (1745), and in Neumann's "Chemistry" (1759) to have been fictitious. Among the most approved varieties used were the light oil obtained from the East, mainly from Persia, the bitumen of the Dead Sea, and the "tar" (or asphalte) of Barbadoes, but an oil obtained by distilling a sandstone saturated with petroleum, which occurred at Pitchford in Shropshire, was largely sold as "Betton's British Oil" (Rees' "Encyclopædia," 1819, article Bitumen).

The purification of petroleum by distillation was carried on by the early pharmacists, but the product appears to have been usually regarded as little better than an artificial petroleum, and was only salable as untreated crude petroleum.

Crude petroleum varies from an almost colorless, highly mobile liquid, to a green, brown, or almost black oil, as viscous as treacle. Its composition varies according to the strata from which it is obtained, but it is mainly composed of hydrocarbons, together with small quantities of bodies containing oxygen, nitrogen, sulphur, and in some cases traces of arsenic, phosphorus, etc. The American oil consists mainly of the saturated hydrocarbons belonging to the methane or paraffin group, but that of Russia, which is obtained from geologically newer strata, is principally composed of members of the naphthene group which, while isomeric with the olefines and very similar in properties to the paraffins, belong to the benzene group, and are therefore entirely different in chemical composition. It is to this peculiarity that the difference in the properties of the distillates from the Russian and American oils is attributable.

The various products now obtained from crude petroleum are said to amount to as many as two hundred, but these are mainly varieties of the mixtures of hydrocarbons which are known in commerce as naphtha, benzoline, kerosene, lubricating oils, paraffin and vaselin. In order to obtain these in a state of purity, they are first separated from the crude oil by fractional distillation, followed by a system of chemical purification by which all coloring matters and ill-smelling substances are separated.

Petroleum naphtha and the still lighter distillate known as gasoline, are used as solvents as a means for purifying various pharmaceutical and other products, and, like benzoline, for cleaning fabrics.

Considerable quantities of colorless and odorless oil intermediate between kerosene and lubricating oil, are now prepared in Russia under the names "perfumery oil" and "mixing oil." For this purpose, the higher-boiling fraction from what is known as "Solar oil," is freed from water by blowing a current of air through it at a temperature of 70° C., until perfectly bright and clear, and is then treated with ordinary strong sulphuric acid, and finally with Nordhausen acid with constant agitation. After the evolution of sulphurous acid, produced by the decomposition of the impurities in the oil, has ceased, the acid is allowed to settle and is drawn off, and the oil is washed with a solution of caustic soda and finally with warm water.

As described by Rossmässler ("Die Petroleum and

Schmierölfabrikation," 1893, p. 78), "perfumery oil" has a specific gravity of 0.800 to 0.885, and does not become yellow or deposit any impurity after exposure to light. It is employed in the preparation of perfumes, and is known in the German Pharmacopœia as "paraffinum liquidum."

"Mixing oil," which is largely used as an adulterant of other oils, is usually of a yellow color, and has a specific gravity of not less than 0.860, and not more than 0.885.

The principal pharmaceutical uses of petroleum products are, however, confined to the varieties of paraffin wax, ozokerite, and vaseline. Paraffin wax is obtained mainly from the higher-boiling fractions obtained during the distillation of American petroleum and Scotch shale-oil, and to a less extent, of Indian petroleum. Russian petroleum yields practically no paraffin, and although large quantities are obtained in Galicia, the product from that country is usually known as ozokerite.

For use in the manufacture of pomades, etc., the softer paraffin wax is preferred, the purer form which is obtained by pressing the soft wax at low temperatures being too hard for this purpose, although largely employed for the manufacture of the better class of candles, for the adulteration of beeswax, etc., as a preservative coating for eggs, and for a large number of other purposes. A common paraffin wax obtained as a bye-product in the manufacture of lubricating oils in America, is used in the preparation of "chewing gum," while a yellow wax obtained from Galician ozokerite, and known as "yellow ozokerine," is used on the Continent as soft paraffin wax is used in this country and in America, in the compounding of ointments and pomades. Like vaseline, paraffin and ozokerite (which is chemically identical with, and physically but little different from paraffin wax) are found to possess far greater permanency than lard, and their absolute freedom from any tendency to become rancid is rapidly leading to their universal use as a medium for the preparation of ointments.

The "yellow ozokerine," mentioned above, is largely purified by means of Nordhausen sulphuric acid, and the colorless product obtained is employed by French perfumers in the process of "enfleurage," i. e., in the extraction of scents from flowers, etc. Vaseline is obtained mainly from American oil, but is also produced from Galician, Russian and German oils. That from the three latter countries, though practically the same as from America, is frequently known as "ceresine," or "cerasin." Although vaseline was first obtained in America by the Chesebrough Company, it is to the Germans that we owe the greater part of our knowledge as to its composition, Engler and Böhm (Dingler's polytechnisches Journal, v. 262, p. 468) having devoted particular attention to the subject.

The method of preparation employed in America is to a great extent a secret one, but is said to consist in the distillation of selected crude petroleum in vacuum stills, and the filtration of the residual pasty mass through animal charcoal. In the Old World the treatment is very similar, but considerable quantities of an "artificial" vaseline are also prepared by admixture of solid paraffin with highly viscous paraffin oil. This material is said to be sometimes preferred, especially when fluidity at a moderature temperature is required, and is included in the German Pharmacopœia, but it is not perfectly homogeneous, and shows a granular structure and a tendency to separate into solid paraffin and oil.

Vaseline consists of a mixture of solid and liquid hydrocarbons, the former of which are entirely without crystalline structure, a feature to which the valuable properties of vaseline are largely due. Like paraffin wax, it consists almost entirely of saturated hydrocarbons, the small quantity of oxygen-containing compounds being almost negligible. Vaseline absorbs a small quantity of oxygen from the air, but its value for pharmaceutical purposes does not appear to be reduced thereby. The so-called "solidified petroleum," which is employed to a slight extent as fuel, for laundry use and as a lubricant, is usually prepared by incorporating liquid petroleum with soaps, or by saponifying fats in admixture with petroleum. It is, however, of little commercial importance, and of still less to the pharmacist.

Dr. Squire has recently described in the Journal of the Society of Chemical Industry (1889, p. 441) an interesting process in which petroleum is employed for the purification of crude alcohol. This process, which not only removes the fusel oil, but also the ill-smelling products contained in the common spirit obtained from molasses, etc., appears to be due to Parsons, of New York, who in 1869 patented the use of paraffin wax for the purpose. The wax was dissolved in the hot alcohol, which was then diluted to 50 per cent. strength, whereby the paraffin was precipitated with the fusel oil, etc. The method now in use is that of Ruffin and Bang, and consists in replacing the wax by liquid petroleum having a boiling point of about 140° C.

PHARMACY.

MANNITE.—A white powder, claimed by the importers to be exempt from duty as "manna," does not resemble any of the varieties named by the dispensatories, but, to quote the official decision of the General Appraiser, it is "obtained by dissolving flake manna in water and subsequent processes of precipitation, filtration and treatment with subacetate of lead, acids and alcohol."

ETCHING LIQUID FOR STEEL.—Mix 1 ounce copper sulphate, ¼ ounce alum, ½ dram common salt reduced to powder, with 4 ounces of vinegar, and 20 drops of nitric acid (Jewelers' Circular). This liquid may be used either for eating deeply into the metal or for imparting a beautiful frosted appearance to the surface, according to the time it is allowed to act. Cover the parts you wish to protect from its influence with beeswax, tallow, or some similar substance.

COMPOUNDS OF PYROXYLIN.—In the testimony taken by the U. S. General Appraisers at a hearing where the rate of duty to be charged upon certain kinds of collodion is questioned, is disclosed the fact that the term "collodion," which is defined by lexicographers as "a solution of gun cotton in ether," is a liquid solution of pyroxylin, and that the term "compounds of pyroxylin" is generally used to denote a solid collodion, which is the residue after the liquid solvents have been evaporated.

SIRUP OF CANE JUICE.—In reviewing a case where protest was made against the decision of the Collector of Customs at this port as to the rate and amount of duties chargeable on certain cane sirup (22 bocoyes miel cana), the General Appraiser commented on the fact that the chemist's second report was apparently contradictory of the first, the latter analysis being made some six months before the second report. The first report of the chemist was accepted, as it was made soon after the importation upon samples carefully drawn and mixed. Little reliance can be placed on samples of molasses or sirup which have been kept any length of time. Deterioration through the inversion of the sugar content is almost always the result of destructive chemical forces ever present in all sweet solutions, unless they are fortified with antiseptics.

TESTING FOR COAL TAR COLORS IN WHITE WINES, AND THE DIFFERENCE BETWEEN THESE COLORS AND CARAMEL.—A. d'Aguiar and W. da Silva (Comptes Rend. 1897, 124 (8), 408 to 410; Jour. Soc. Chem. Ind.), do not agree with the results recently published by Magalhaes, and they find that caramel, when added to a wine, can be distinguished from the coal tar colors. The wine is rendered alkaline by the addition of ammonia, and is then shaken up with amyl alcohol. The color taken up by the latter is noted, and also a dye trial is made with a little silk. The amyl alcohol becomes but faintly colored if caramel only is present, and the fixation of the latter by silk is also very feeble. In the case of wines to which coal tar colors have been added, the silk generally becomes distinctly dyed, and where this is not the case, the coloring matter (e. g., chrysoidine, amido-azobenzene) can be identified by other reactions.

HEAT-INDICATING PAINT.—"At a recent meeting of the (London) Physical Society," says Industries and Iron (Lit. Digest), "Dr. Thompson exhibited specimens of a heat-indicating paint composed of a double iodide of copper and mercury, originally discovered twenty years ago by a German physicist. At ordinary temperatures the paint is red, but when heated to 97° C. (206° F.) it turns black. Paper painted with this composition and warmed at a stove, exhibits the change in a few seconds. A yellow double iodide of silver and mercury is even more sensitive to heat; changing from yellow to dark red at a temperature of 45° C. (113° F.). Many suggestions have been made from time to time as to the utility of such a paint; for instance, it has been suggested that it might be used on machine bearings to give warnings of their heating, but we opine that the costliness of the material would in a great degree prevent its adoption either for this or any other of the numerous purposes to which it might otherwise be well applied."

FORMALDEHYDE AS NORMAL PRODUCT IN BEER, WINE AND SPIRITUOUS LIQUORS.—Farnsteiner found that when beer or wine are distilled off the presence of formaldehyde in the distillate can be determined by means of the reaction given below (Forschungsber. f. Lebensmittel.) though no addition of formaldehyde has been made. It will, therefore, be necessary to be very careful in judging a beer or wine in regard to the addition of formaldehyde, especially when but slight reactions are obtained. For detecting very small quantities of formaldehyde we proceed as follows: Five cubic centimeters of the distillate are mixed with 1-10 cubic centimeter of a 1 per cent. peptone solution, and, from the top, without touching the sides of the receptacle, 2 cubic centimeters of a 90 to 94 per cent. sulphuric acid are added, which contain 5 drops of a 1 per cent. solution of chloride of iron to every 100 cubic centimeters. The substances are now mixed quickly, heated to boiling in 10 seconds, while continuously shaking, and the coloration is then observed after a lapse of one hour. In the presence of 0.01 to 0.05 milligrammes formaldehyde in 100 cc. of the distillate some blue violet coloration still appear. If the amount of alcohol present exceeds 10 per cent., the reaction is injured.

TINCTURED SUGAR.—In an opinion recently rendered General Appraiser Wilkinson, New York, says that the tariffs of 1874, 1883, 1890 and 1894 contained a provision for tinctured sugar, but inquiry in various directions failed to disclose any trade meaning of that term, and, therefore, its construction must be in accordance with dictionary definition and popular understanding. After quoting these definitions as given by the various lexicographers, the General Appraiser proceeds to apply them in the decision of a case where the importers protested against the decision of the Collector of Customs, the merchandise imported being German refined sugar of a high grade, and, according to the testimony, "it was tinctured with vanilla crystals at the rate of one ounce of the latter to two tons of sugar." The sugar was assessed for duty at 40 per cent. ad valorem, with additional duties of 1/8 and 1-10 cent per pound by the Collector, the importers, however, claiming it to be dutiable as tinctured sugar at 35 per cent. ad valorem. The evidence adduced failed to show that the merchandise was tinctured, and to quote the opinion of the Appraiser, "one ounce of vanilla (vanilla crystals) does not possess sufficient virtue to bring two tons of sugar within the lower tariff rate." The protest of the importers overruled.

THE USES OF FRUIT.—Of all the classes of Nature's edible productions, that of fruit is most pleasing to the senses. That fruit alone will not sustain life for a prolonged period is true, but that the organic salts and acids of fruit are necessary to the maintenance of perfect health is equally correct. Prof. A. R. Elliott (Dietetic and Hygienic Gazette, Sci. Am.) summarizes the uses of fruit as follows:

1. To furnish a variety to the diet.
2. To relieve thirst and introduce water into the system.
3. To furnish nutriment.
4. To supply organic salts essential to proper nutrition.
5. To stimulate the kidneys, increase the flow of urine and lower its acidity.
6. To act as laxatives.
7. To stimulate and improve appetite and digestion.
8. To act as antiscorbutics.

Concerning the mode of preparation, ripe fruits as a rule do not need to be cooked, and are much more palatable and equally nutritious in the uncooked state. The proper time to eat fruit is either at the beginning of a meal or between meals, when they aid digestion and exert the greater laxative effect. Taken at the completion of a meal, they dilute the gastric juice and tend to embarrass digestion.

MENTHOL CHLOROFORM FOR COLDS.—Wünsche (Therapeutische Monatshefte) says that menthol dissolved in chloroform is the most efficacious of all remedies. A solution of one or two parts of menthol in twenty parts of chloroform will not only arrest the progress of a cold in its initial stage, but it is also an excellent influenza prophylactic. From four to six drops of the solution should be placed in the hollow of the hand, quickly rubbed between the hands, the two hands, tightly pressed together, placed before the face, and the remedy energetically inhaled alternately through the nose and mouth. It will be immediately noticed that the volatile parts of the solution thoroughly impregnate the mucous membranes of the nose, mouth and throat, and even penetrate deep down in the air passages. During the first two or three inhalations the sweetish chloroform vapor predominates. After, however, only menthol in attenuated condition is inhaled, odor and feeling remaining apparent for some time after the inhalation. As a rule, the first inhalation suffices to cure the severest tendency to sneezing, and often to arrest the progress of the cold altogether. Two further applications of the remedy in the course of the day suffice to suppress the attack completely. The first inhalation at first slightly increases the flow from the mucous membrane of the nose; afterward, however, this symptom diminishes quickly. Pains in the pharynx and larynx may be quickly eased and often entirely relieved by the remedy.—Med. Age.

(*Continued from p. 566, May 13, 1897.*)

*THE BOY IN PHARMACY.**

By RUDOLPH F. RUPPILER, Ph. G., Covington, Ky.

II.

TRAINING OF THE BOY.

We will now suppose, for the purpose of expediting as much as possible the entry of the right kind of boy into pharmacy, that the boy who, unbeknown perhaps to the bald-headed gentleman with gold-rimmed spectacles, had been gazing, at some more or less previous date, through the windows of his apothecary shop, and longing to be one of the active figures in it, eventually, when the occasion has presented itself, applies for a "job," with those feelings of terror which only the juvenile mind can conjure up while passing through this ordeal. The upshot of his interview with the "boss" can be read in his beaming countenance as he emerges from the sanctum. He has the job. Poor boy! Your hide will become somewhat thickened before you reach a much later stage in your progress!

Does the bald-headed gentleman with the gold-rimmed spectacles know what is required of himself and what to do with the boy? What are the duties of the boy, and what share of the general work in a drug store is the boy to take up to further the interests of the business? Let us examine this question minutely.

Let the boy have a system in everything he is called upon to do. With discipline as his watchword, he lays the foundation for the successful financial conduct of a future pharmacy, as well as acquires habits which eventually make him a professional success. Let him begin his most trivial and menial work with discipline. Discipline begets perseverance, and perseverance is the forerunner of success. The requirements of a boy are not the same in all stores, and his duties can be altered to adjust themselves to the various needs in different pharmacies; but discipline should be a law, as it is undeniably an advantage, in every store. I have found it an advantage to write out a schedule of work in the order in which it should be done, and then to insist on its being done just so, until it became a habit with the apprentice. Let it be his first lesson. It is not an easy matter to break off a habit.

When an employer excuses a neglect of duty on the part of the apprentice by saying that "he is only a boy, and much cannot be expected of him," and then shoves the neglected and menial duty upon a graduate in pharmacy in his employment, he not only shows a want of discipline but pays high for such services by compelling a neglect of those higher duties and responsibilities for which the clerk is paid, as well as lowering the dignity of his profession. The public think little of the professional qualifications of a clerk who is at one and the same time employed as a porter and general factotum, and then intrusted with the responsibility of filling their prescriptions. The duties of a drug store boy are not proportionately as arduous as those of a full-fledged clerk. In fact, he is a dull boy who cannot go through the routine of his work, which consists ordinarily and mainly of sweeping out, dusting, cleaning spittoons, cases, mirrors and mortars, and running errands. How often are these duties permitted to be neglected systematically by the "boss"—the only systematic thing about him, perhaps—and as systematically neglected by the boy.

A fastidious gentleman in broadcloth who unthinkingly leans on a showcase and then finds that his sleeves have served the purpose of a dusting rag; or one who calls for a cigar and is then compelled to ask for a light because the cigar lamp is out; or a lady who lays a valuable book upon a sloppy soda counter or soils her gloves or hands upon a dirty holder—none of these allow their prescriptions to be drawn by any irresistible attraction toward the unseen mystical operations going on behind the prescription counter, nor do they find any special inducements to come back again out of their way to the same store to meet with like accidents. These are mere instances of a boy's neglect of duty. Tobacco-bespattered spittoons and fly-specked mirrors are others. No pharmacist of sense or experience in this connection can think it reasonable to impose these duties upon the man who fills his place during his absence, nor will any clerk of sense or self-respect assume these duties when the cause for them can be removed by a proper disciplining of the drug store boy. This may be done with kindness, but all insubordination and insolence in connection with prescribed rules should be dealt with severely.

A general synopsis of rules may be summed up as follows:

1. As regards cleaning, a regular routine of work to be done daily and in an invariable order, to prevent an oversight.
2. Special days for special work.
3. A set time for study and recreation.
4. All of these duties, when interrupted by errands or such waiting on customers as the boy can do, to be taken up again as soon as the duty which caused the interruption has been dispatched.

The disorder and lack of harmony which manifest themselves in multifarious manners and ways in some drug stores can be traced to a negligent boy and a lenient proprietor, the boy being the disturbing element and the proprietor the cause of it. Those coming from the sick bed of one whom they love, or persons who are themselves sick, are especially sensitive to such want of harmony and order. Customers less susceptible to external influences are likely to become more forcibly aware of the kind of management, or rather mismanagement, the store is under before they have fairly entered it, by jolting themselves in a stumble over a carelessly placed rug or door mat, while the boy is permitted officiously to harangue some casual visitors about topics of which he shows a disgustingly small and crude knowledge or understanding.

An Episode.

The writer, on one of his days off, had stumbled into precisely such a drug store, and it may be of interest to his brother pharmacists to record no more than a half-hour's experience. The lines of Burns—

> O wad some pow'r the giftie gie us
> To see oursels as others see us!
> It wad frae monie a blunder free us
> And foolish notion.

came to my mind as I watched the panorama going on before me, with especial reference to the conduct of the boy, who, with baseball score card in hand, was discussing baseball with a vim and vigor that denoted his ambition to be strong in that direction. It was early morning, and the store was supposed to be undergoing the process of cleaning. I say *supposed*, with especial emphasis on the word. The proprietor was out, and the clerk had received several prescriptions which he was busily compounding when several customers called at the cigar counter. The clerk stepped from behind the prescription counter to call the boy's attention to them. He had now drifted on to bicycles as a theme with which to entertain casual visitors, and to the clerk's call, after more confabulation and delay, answered, "All right professor!" Then, having waited upon the customers with great assumption of airs, he returned to the theme of bicycles, leaving the store, with its dusty showcases, untidy soda fountain, dirty spittoons and mirrors, in precisely the same condition that it had been for twenty minutes. The clerk's attention had been absorbed in his prescription work. Two prescriptions had been waited for and the other, which was to be sent out, was now ready. The bottle was handed to the boy with instructions, which were only half-listened to, while the continuation of the bicycle theme was going on, when a lady entered and requested the clerk to call up Dr. J—— by telephone and inquire if Mrs. Dr. H—— had gone to Washington. Dr. J—— was not in, and Mrs. Dr. J—— did not know. The lady would call later on. Hereupon the boy saw fit abruptly to drop the subject under discussion, and, with medicine still in hand, approached the clerk as he left the telephone and declared that he should have told which Mrs. Dr. H— it was, as Dr. J— (whom he had never seen) knew more than one Mrs. Dr. H——. When questioned he knew absolutely nothing about any of the persons concerned. Upon this the clerk ordered him to deliver the medicine at once, as it had been considerably delayed by this useless squabble, and, when he returned, to clean up the store. The boy responded, "I don't see you doing anything."

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* Second portion of a paper printed in Western Druggist.

It may seem ridiculous to have dwelt on the narration of such apparently trivial details; yet I have purposely, though as briefly as possible, recounted them to show the ridiculous and disgusting aspect which the drug store boy is sometimes permitted to assume toward his superiors. Such and similar occurrences are not uncommon in drug stores. Boys of this caliber are too frequently permitted to grow up in this way. The strong arm of discipline would readily decide the question as to whether such manifestations are an evidence of incorrigibility, or a want of precepts and principles, and would either drive the boy out of pharmacy or make him a useful member of it.

Discipline Indispensable.

Experience and observation have led me to believe that the successful and harmonious conduct of a pharmacy depends on having the various positions of proprietor, clerk and boy (in the singular or plural) properly filled; and this in turn depends on the attainments of the individual occupants of the several positions. The culture and training which these attainments represent, in order to be thorough, must begin at the beginning, and therefore the attainments of the boy immediately before, and his training immediately after, his entry into the pharmacy are factors of most vital importance to his properly filling later and higher positions in a drug store. Training is especially necessary, because at that period of his life he has little capacity for directing his own efforts. It is the critical period, and his technical education and training by virtue of priority are all-important. To have the other positions properly filled also, brings us to the reflection that where it is impossible to preserve order it is impossible to obtain a full and complete success. To remedy this we must start with the boy again.

Leniency of government—whether it be that of a pharmacy or anything else, from a country town to a stable—which permits an infraction of laws or rules, provided they are just, is bound to redound to the injury of the government as well as of the governed. The untrained boy is the most untractable element in the government of a pharmacy, and frequently remains such through all the several positions that he is afterward called upon to fill, even to proprietor, when, if he were asked how he had attained his position, he might say, in the words of Topsy, "s'pect I growed." It is needless to say that the pharmacist who as a boy (which we will say is the period up to his graduation) has not been taught the discipline which constitutes good government in pharmacy, is hardly capable of conducting a pharmacy without constantly recurring incidents of disorder and annoyance.

On the other hand, the boy, being thoroughly drilled in the all-important duty of keeping the store clean and tidy by a system of prescribed rules, until habit has created dispatch, gradually and during the course of such duties acquires a knowledge of such rudimentary studies as weights, measures, etc., and an imperfect conception of the nomenclature of pharmacy, which frequently makes him useful in getting preparations and drugs for the prescriptionist. In the cleaning of mortars, etc., which follows in his invariable routine the performance of some other equally invariable duty, he is instructed of the various natures of the articles which have soiled them, and of the solvents with which they are cleansed; by which means he acquires a practical, although rudimentary, knowledge of chemistry, which is rarely, if ever, effaced from his memory, and frequently serves him in later and more important emergencies.

Thus as time goes on and he becomes more adept in the duties assigned him, with a consequent saving of time, his own interests should not be overlooked, nor should he be made to feel that the important conformity to discipline is without its own reward. A certain and regular length of time for study should be alloted him during the course of the day when the influx of business has somewhat subsided, which varies in different localities, and can be arranged accordingly. Such studies should not be interrupted except by errands of importance. He should, in connection with a text-book, such as Remington's "Practice of Pharmacy" or any work of similar scope, and by various means within the resources of his preceptor, be encouraged—for the most ardent student's interest flags under a listless instructor—to acquaint himself with especially the physical properties as well as, if possible, of the physiological action and dosage of the drugs and chemicals which come under his observation.

With all this encouragement he should be made to understand that his studies are not to conflict in the remotest degree with the irrevocable law pertaining to the performance of those other duties which he is by this time prepared to consider as his own. In this way, while he conceives an idea of his preceptor as a strict disciplinarian, his sympathies and common-sense teach him that he is at least a just one. The boy under the care of a disciplinarian not only serves the interests of his preceptor in full, but serves his own interests as well, and eventually, by his thorough grounding, he may perhaps save the interests of the whole profession of pharmacy.

Too often, and I can attest to the fact by personal knowledge, the boy, not rarely a naturally bright one, after an apprenticeship of three or four years, is so utterly ignorant in pharmaceutical knowledge that it does not extend beyond knowing where to find things, without even the remotest conception of what lies behind a label; and during all that time the routine work of the store has been as prodigiously neglected. This is a most profligate waste of time and a menace to the profession.

This kind of boy, as he advances to that stage of his existence when he is no longer legally considered an infant, prepares his way for his future position by rallying all his hosts in the way of text-books, quiz compends, ponies, etc., and by a masterly and judicious system of cramming, breaks through the crust of pharmacy with a knowledge as superficial as it is unlasting; assaults the State board, with perhaps a varying number of repetitions of the assault, and finally flounders through it by a hairbreadth escape to gain the position and emoluments of a pharmacist. The same individual may take a different but more protracted route to the same goal by way of the college of pharmacy, where, after meeting with nearly the same adventures and by the same system of cramming, but only a more prolonged one—the consequence of not being well drilled in the rudiments of his art—he obtains his diploma, unfortunately for the poor public, which is often won by plausible ways rather than by intrinsic worth, and proceeds, in conjunction with physicians, to apply his physic. It is a wise provision of nearly all colleges of pharmacy to require a preliminary experience, and no discredit can attach to them because the moral obligations of pharmacists in this connection have often been neglected.

In dealing with what should constitute the virtues of the drug store boy in the several stages of his progress, I have quite naturally been led also in the opposite direction, by way of comparison, into a discussion of what may be considered his glaring faults; but such alternations of his good and bad qualities can but set them off more prominently by contrast.

I will briefly resume the subject in its brighter aspect, and return to the boy who is amenable to discipline and is fortunate enough to be governed by it. The moral obligations of the boy and his preceptor to each other, by which the interests of both are augmented, with especial reference to the boy's right to better means for facilitating the acquisition of his earliest pharmaceutical knowledge, is the scope of this article. It is not my intention to go into the minutiæ of a preparatory course of study for the college of pharmacy, as every pharmacist is best capable of directing such a course of study himself. I contend, however, for such a course of study as well as practice, and the suggestions which I offer may serve as a reminder of obligations, and thus be of some mutual use to him and to his charge.

The boy, having by gradual steps familiarized himself tolerably well, during two or three years' progress in his apprenticeship, with the physical, physiological and therapeutical properties and dosage of the more frequently used medicaments, is well prepared to begin the making of such preparations requiring little skill; until by degrees he can be intrusted with the preparation of the most difficult, involving skill, care and accuracy. In the work at the prescription counter, requiring as it does a considerable knowledge of chemistry and a nice discrimination of incompatibilities only attainable by considerable experience under a vigilant preceptor, he must necessarily not be permitted to rely solely on his own resources. He should be only an assistant. As such, however, every effort should be made, where practicable, to explain to him all difficulties.

A drug store experience under a conscientious and exceptional preceptor sometimes places the one receiving it on an intellectual level with, and occasionally on a higher intellectual level than, a college graduate. This is, undeniably, however, the exception and not the rule. An experience at the store, unsupplemented by a college education, is usually as inadequate as a college education without the necessary store experience. An education at a college of pharmacy in addition to a store experience should by all means be made compulsory before the responsibility of conducting a drug store is awarded; for here the boy, whom we are pleased to call a young man by this time, gains that greater theoretical and practical knowledge of pharmaceutical chemistry so essential to his business, as well as having those general principles of pharmacy inculcated which he can apply to the scattered store of isolated facts that constituted his stock of knowledge in his ante-college days.

The object which a drug store boy has in common with all the rest of humanity, is to derive from existence such pleasure and satisfaction as arise from a well directed and well trained intellect, and by means of which he can eventually place himself upon a secure footing, aloof alike from the charity and inhumanity of his fellow-man. An idle mind, or a mind unoccupied in the pursuit of some useful knowledge, or one wholly engrossed in some monotonous manual occupation, becomes after a while, according to the nature of its possessor, either shallow, or else, craving such food as it needs and being denied it by stress of circumstances and environment, it seeks a vent for its activity in the pursuit of those sensual and corporeal pleasures that sooner or later in a degree wreck it and its possessor. This is often the lot of the overworked and undereducated drug store boy. Our minds as well as our bodies need food, and both are as readily and naturally capable of distinguishing a palatable from an unpalatable diet, as they are quick to show the effects of a starvation one. I plead for a better intellectual bill of fare for the drug store boy, from the time that he enters a pharmacy to the time when after graduation he starts upon the career in which he will have to rely upon his own resources, which, with a robust intellectual constitution, if I may use that expression, he would be found amply able to do.

QUESTION BOX

The object of this department is to furnish our subscribers with reliable and tried formulas and to discuss questions relating to practical pharmacy, prescription work, dispensing difficulties, etc. Requests for information are not acknowledged by mail and ANONYMOUS COMMUNICATIONS RECEIVE NO ATTENTION.

Interstate Registration.

(J. G.) See this journal, March 11, 1897, page 303.

Warburg's Tincture.

(J. J.) Standard formulas for Warburg's tincture and Warburg's tincture with aloes are given in the National Formulary, a work which every druggist should have.

He Wants an Opening in Florida.

(Trinoal) wants information regarding an opening for a druggist in Florida. May be some one of our readers can supply the information.

Anti-Corrosion Coating for Copper Boilers.

(F. v. W.) wants information regarding an "invisible heat-proof coating to prevent corrosion of copper boilers." Who can give it to him?

Combined Label Cabinet and Poison Case.

(S. & W.) want to know where they can purchase a cabinet which can be used for labels and as a poison case, or either. Can some reader give the desired information?

Compound Syrup of White Pine.

(Leavitt). The National Formulary offers an excellent formula under this title. Other formulas are given in the March 25 and April 1, 1897, issues of this journal, pages 363 and 393 respectively.

Compound Mixture of Chloral and Potassium Bromide.

(C. P. S.) The working formula for this preparation may be found in the National Formulary. See that work, revised edition, No. 261. As you are probably aware extract cannabis indica is practically insoluble in aqueous mixtures, and the precipitation of the resin cannot be wholly avoided. In the formula above cited the difficulty is somewhat overcome by use of tincture of quillaja (1 fl. ounce to pint of mixture), which holds the resin in suspension.

Lemon Extract. (Flavoring.)

(Subscribers.) About as satisfactory a formula as you can select is that of the Pharmacopœia. A formula for a "soluble" extract is given in this journal, March 4, 1897, page 273. Here is another formula:

Oil of lemon	2½ ounces
Cologne spirits	16 ounces
Water	48 ounces
Magnesium carbonate	1 ounce
Tincture turmeric, a sufficient quantity.	

Put the magnesia into a mortar; rub in the oil; stir in the spirit slowly; pour into a gallon bottle and set aside for two days; then add the water a portion at a time, shaking well. Let stand for a week; filter and add the tincture of turmeric.

Druggists Privileges Under the Raines Excise Law.

(E. F. C.) writes to ask whether he is liable to prosecution by the Excise Commission for selling such preparations as Hoff's Malt Extract, Pabst Malt Extract, Duffy's Malt Whiskey, Celery Compound, and Rock and Rye.

Any druggist is at liberty to sell medicines which contain a small amount of alcohol necessary for the preservation of the medicinal constituents. But if the preparation is used as a beverage he must have an excise license to sell them. The status of the goods mentioned has not been officially determined. The only safe course is to take out a license, unless you are in a prohibition town. See this journal, May 22, 1897, page 663.

Headache Powders.

(A. M.) Try one of the following:

(1)	Acetanilid	30 grains
	Caffeine	5 grains
	Sodium bicarbonate	30 grains

Mix and divide into 10 powders.

(2)	Acetanilid	60 grains
	Sodium salicylate	40 grains
	Sodium bicarbonate	20 grains
	Caffeine	10 grains

Mix and divide into 15 or 20 powders.

(3)	Phenacetine	1 dram
	Salicine	1 dram
	Sodium bicarbonate	30 grains
	Powdered rhubarb	15 grains
	Caffeine	10 grains

For 20 powders.

Vehicle for Acetanilid, Salol and Sodium Salicylate.

(P. H.) It is difficult to obtain a satisfactory vehicle for acetanilid, salol and sodium salicylate in the proportions you name, or in any proportions in liquid mixture, owing to the comparative insolubility in water of the first named two. Both are quite readily soluble in alcohol, and it is possible that by making the vehicle strongly alcoholic you can secure a satisfactory preparation. A few experiments are necessary to determine the proper proportions, but for a "starter" we suggest you dissolve the acetanilide and salol in 25 per cent. of alcohol, add 50 per cent. of glycerine and lastly, 25 per cent. of water in which the sodium salicylate has been previously dissolved.

Salol is sometimes employed in liquid mixtures, being held in suspension by the use of mucilage.

"Rheumatic and Neuralgic Liniment."

(Leavitt.)

(1)	Alcohol	4 ounces
	Spirits turpentine	4 ounces
	Sweet oil	4 ounces
	Aqua ammonia	1 ounce
	Gum camphor	1 ounce
	Oil origanum	½ ounce
	Chloroform	½ ounce
(2)	Camphor	1 ounce
	Oil amber	1 ounce
	Oil origanum	2 ounces
	Crude petroleum	4 ounces
	Kerosene oil	10 ounces
	Oil turpentine	16 ounces
(3)	Castile soap, powder	4 ounces
	Oil origanum	2 ounces
	Oil hemlock	2 ounces
	Oil sassafras	2 ounces
	Camphor	4 ounces
	Aqua ammonia	8 ounces
	Alcohol	32 ounces

Pepsin Phosphate.

(K. S. H.)

(1)	Pepsin, scale	1 dram
	Acid phosphates	1 ounce
	Syrup raspberry	1 pint
	Extract vanilla	1 ounce
	Syrup, enough to make	32 ounces
(2)	Glycerite of pepsin, N. F.	8 fl. ounces
	Syrup, wild cherry	8 fl. ounces
	Syrup vanilla	8 fl. ounces
	Sherry wine	2 pints
	Solution acid phosphates	8 fl. ounces
	Simple syrup	4 pints

(3) Pepsin, Malt Phosphate (Standard Formulary).

Elixir pepsin	4 fl. ounces
Malt extract, thick	4 fl. ounces
Orange wine	4 fl. ounces
Cinnamon syrup	2 fl. ounces
Solution acid phosphates	2 fl. ounces
Orange flower water	1 fl. ounce
Red orange syrup, enough to make	32 fl. ounces

Elixir Phosphates of Iron, Quinine and Strychnine.

(C. P. S.) Nearly all of the preparations dispensed under this title contain, besides iron phosphate, quinine and strychnine in some other form than as phosphates. (See "elixir of phosphate of iron, quinine and strychnine," National Formulary). If you must have an elixir containing the three bases in the form of phosphates, try the following formula, the phosphates being held in solution by the excess of hydrochloric acid:

Solution ferric chloride, U. S. P.	7½ fl. drams
Quinine, alkaloid	110 grains
Stychnine acid, U. S. P.	2½ fl. drams
Phosphoric acid, U. S. P.	2½ fl. drams
Distilled water	2 fl. drams
Alcohol	1 fl. ounce
Simple elixir	10 fl. ounces
Simple syrup, to make	1 pint

Mix the iron solution, phosphoric acid and water, and in the mixture dissolve the alkaloids. Add the syrup and then the elixir and alcohol previously mixed.

Soothing and Pain Relieving Compounds for Children.

(Leavitt.) The Era Formulary gives the following for

Soothing Syrup Without Opium.

(1)	Ammonium bromide	960 grains
	Chloroform	2 drams
	Fluid extract conium	2 drams
	Tincture hyoscyamus	4 drams
	Dextrin syrup	8 ounces
	Water, sufficient to make	16 ounces
(2)	Oil anise	25 minims
	Alcohol	2 ounces
	Fluid extract valerian	1 ounce
	Oil peppermint	15 minims
	Spirit camphor	2 drams
	Fluid extract licorice	1 ounce

Shake the bottle. Dose, 5 to 30 minims in water; repeat as needed.

Teething Compound.

(3)	Potassium bicarbonate	16 grains
	Potassium bromide	16 grains
	Tincture chloroform, compound	½ dram
	Simple syrup	½ ounce
	Water, enough to make	2 ounces

Compound Syrup of Iron Hypophosphites.

(H. S. L.) We know of no distinctive preparation under the above title, but in the following prescription we should have, if not able to consult the prescriber, no hesitancy in dispensing compound syrup of hypophosphites of the National Formulary:

Guaiacol	1½ drams
Alcohol	q. s.
Compound syrup of iron hypophosphites	(?)
Water (?), to make	6 fl. ounces

As guaiacol is an oily liquid insoluble in aqueous mixtures, it is quite likely the prescriber proposed to make use of its solubility in alcohol by prescribing that substance to the effect partial solution in this mixture. This may be done, but we think a much better method would be to emulsify the guaiacol with mucilage, add the syrup and send the mixture out under a "shake" label. We have questioned the quantities of syrup and water prescribed in the above because it is not clear from the prescription just how much of each is wanted.

Acetanilid and Salicylic Acid.

(F. F. R.) asks, what reaction takes place on heating a solution of acetanilid with salicylic acid until dissolved. He says he discovered an oily looking substance in the bottom of the test tube which became brown and hard upon cooling the solution. Crystals were also found on the sides of the test tube.

Our correspondent gives but few details of his manipulations. His solution of acetanilide, if aqueous and saturated, must have been very weak, and he gives no hint at all as to the amount of salicylic acid employed. We think, however, from his description of his work that he has used more of both of these substances than can be held in solution at ordinary temperature. The acetanilide was probably melted and slightly darkened by the heat. The crystals noticed were those of salicylic acid or acetanilide, or both, which appeared upon cooling the mixture. When mixed in the dry state and fused, acetanilide and salicylic acid form what is known, when powdered, as salicylanilid (Coblentz. "Newer Remedies," 2d edition, page 69.)

Machinery and Apparatus for Acetic Acid Works.

(Creosote). An interview with a representative member of the trade in these products in this city brings out the information that there is no one manufacturer who makes a specialty of equipping factories with all the machinery, apparatus, etc., needed for the manufacture, on a large scale, of acetic acid, creosote, pyroligneous acid and other products of the destructive distillation of wood. This business, we are told, is a comparatively small one among the industries, and the equipment of such plants is rather a composite affair. Thus wrought iron stills are made by workmen in one industry, iron pans by another, copper stills and condensers by a third, and so on. As a rule, the plant and its equipment are designed by a chemical engineer in much the same way as an architect drafts the plans for a building. To the contractor or builder is then left the duty of assembling the materials, machinery, apparatus, etc., from the various makers. Competent and experienced managers for works of this kind of manufacturing cannot be picked up on short notice. You can best get track of the kind of men you want by advertising for them.

Transferring Pictures, Prints, Etc.

(R.) In order to transfer prints of various kinds to glass, wood, etc., soak them for a short time in a solution of 10 parts of potassium hydrate in 90 parts of alcohol (more or less). This procedure is to soften the varnish in the printer's ink. After rinsing in pure water the print is placed, face down, on the plate which is to receive the picture or print, covered with a dry sheet and then pressed with squeegee or in a letter press.

Colored prints are painted over with a colorless sticky varnish, pressed against the object intended to receive them, and, when dry, the paper is removed by rubbing cautiously with an aqueous solution of potash.

Some years ago a French typographical journal gave the following curious process for the reproduction of any printed design whatever—pictures, printed pages, etc. The paper to receive the reproduction is treated with the following, which is applied with a sponge, or, preferably, with a soft flat brush:

Gelatin	10 parts
Ferric chloride	22 parts
Tartaric acid	10 parts
Zinc sulphate	10 parts
Distilled water	400 parts

Mix in the dark, and keep in a deep, orange colored glass bottle (an ordinary bottle, tightly covered with a heavy, yellow-colored paper, and kept in a close pasteboard box, will answer). The coating should be applied in a dark place, and the paper dried in the dark. When dry, place the design on the coated surface, and bring into close contact. Place on a sheet of glass, cover with another, clamp together, and expose to the direct rays of the sun until the yellow cover of the surface of the sensitive paper is bleached to a white. Remove from light, and develop by leaving for three or four minutes in the following:

Gallic acid	2 parts
Alcohol	7 parts
Distilled water	100 parts

If left exposed exactly the right length of time, the lines will appear on a white ground of an intensely black color. If exposed too long they will be more or less gray.

Several other processes were given in this journal, April 11, 1895, page 463.

Wine Ether; Cocinic Ether.

(I. B. F.) Wine ether as made by some manufacturers is a compound prepared by admixture of pelargonic, acetic and butyric ethers, the formula, however, varying with the ideas and experience of the individual manipulator. Just what is wanted in your particular formula we cannot say. Ethers having the odor of wine and brandy are obtained by the oxidation of fatty acids. Thus, when neutral or fatty acid bodies are submitted to the action of concentrated nitric acid, two kinds of products are formed—non-volatile acids, such as pimelic, adipic, lauric, etc., acids which remain in solution—and volatile acids, which distil over, the principal of which are pelargonic, butyric, valerianic, capric, caproic, caprylic, oenanthic, etc.

Dussauce gives the following method for utilizing these reactions: Take a fatty body, solid or liquid—oleic acid is one of those which succeeds best; place it with eight or ten times its volume of concentrated nitric acid in a retort, and cautiously heat. The more concentrated the acid the larger will be the proportion of pelargonic acid obtained. The operation is continued until all of the fat has disappeared. The product contained in the receiver is composed of nitric acid and of an oily bed of volatile acids, which are washed two or three times, neutralized with a solution of potash, the potash salts decomposed with sulphuric acid, and the organic acids transformed into ethers by treatment with alcohol, etc.

Cocinic ether is obtained by etherifying cocinic acid extracted from coco oil. To prepare it, saponify coco oil with a solution of potassa, of a density of about 1.12. Decompose this soap by hydrochloric acid, and the soft product thus obtained is pressed to separate the oleic acid. The cocinic acid furnished by the pressure is dissolved in the alcohol, and treated while warm by a current of dry hydrochloric acid gas. A slightly yellowish liquid is thus obtained having a penetrating odor; it is washed with water, then with a weak solution of sodium carbonate; it is cocinic ether nearly pure.

These products are generally met with in commerce only in solution in alcohol, to which they are usually added in the proportion of about 10 per cent.

A SUBSTITUTE FOR AMPUTATION.—"A new and simple mode of treatment has been introduced in France," says The Medical Times, by which, it is claimed, a large proportion of the injured limbs now usually amputated, can be saved. The method, which is due to Dr. Reclus, was recently described before the French Congress of Surgery, and is thus explained:

"'Whatever the extent or gravity of the lesions, he never, under any circumstances, amputates the injured limb, but merely wraps it in antiseptic substances by a veritable embalming process, leaving nature to separate the dead from the living tissues. This method of treatment possesses the double advantage of being much less fatal than surgical exaresis, and of preserving for the use of the patient, if not the entire limb, at any rate a much larger part than would be left after amputation.

"'He advocates this very conservative treatment on account of the excellent effects of hot water, which he uses freely. After the skin has been shaved and cleansed from all fatty substances by ether, etc., in the usual way a jet of hot water 60° to 62° C. (140° to 144°) but not higher, is made to irrigate all the injured surfaces and to penetrate into all the hollows and under all the detached parts of the wound without exception. This is the only way of removing all clots and to wash away all foreign bodies, together with the micro-organisms they may contain. The advantages of hot water at this high temperature are threefold: First, hot water at this temperature is antiseptic. Heat greatly increases the potency of antiseptic substances; second, it is hemostatic (blood stanching); third, it helps to compensate for the loss of heat resulting from the bleeding, and especially from the traumatic shock. After the "embalming" process, and the dead tissue has been separated from the living, the surgeon has nothing to do except to divide the bone at a suitable spot. According to Reclus the results attained are remarkable.'"

THE PHARMACEUTICAL ERA

[*WEEKLY.*]

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SPECIAL NOTICES.

PUBLISHERS' BULLETIN.—The attention of our readers is directed to the Publishers' Bulletin, which appears regularly on the first page of the Trade Department.

REMITTANCES.—Subscribers are cautioned not to pay money on our account to any parties representing themselves as agents or collectors for this paper, as we are responsible only for payments made direct to this office.

ERA COURSE IN PHARMACY.

Our subscribers will please take notice that all the regular lectures of this course, also the additional lectures and papers on special topics, will be printed weekly in the regular editions of the Era, and be free to all subscribers to this journal.

The course year is from July to June, inclusive. The issues of July and August will be devoted to preliminary announcements and the preparation of students for the regular course of lectures which will start in September. There will be two terms of twenty weeks each, or forty weeks of instruction with more than 100 lectures.

The only extra cost to subscribers who wish to join the regular classes for the quizzes, examinations, etc., is a Registration Fee sufficient only to cover the expense of conducting the quizzes and examinations by mail direct with each student, to pay for recitation blanks and postage, and the expense of quiz masters. This fee for the two terms (40 weeks), is $4.00, (10 cents per week). An Era Binder, if wanted for preserving the copies of the journal as received, will cost an additional 75 cents.

Applications for matriculation should be filed before June 30, 1897, and each matriculant must be a subscriber to the Era in his own name, and his subscription paid in advance to June 30, 1898. A prospectus giving further particulars will be found elsewhere in this issue.

More About Substitution.

The National Advertiser in its issue of June 1 responds to our article entitled "The Red Flag" as follows:

> The National Advertiser has no "method of attacking the drug trade," or any other trade. This appears clearly from the very article copied by the Pharmaceutical Era. Former attempts to put down substitution failed because the drug trade in general was accused. The merit of the National Advertiser's notices is that they make no discrimination, except between honest dealers and dishonest ones. Why should any member of the former class consider himself aggrieved because he is required to give customers what they ask for.
>
> The Pharmaceutical Era says: "They (makers of proprietary articles) seem to act upon the principle that, because they send a customer to a drug store, the druggist is bound by all that he should consider sacred in business to supply just exactly what that customer asks for."
>
> Well, what's the matter with the principle? If you admit that substitution is justifiable, and that the man who sends trade to a retailer is not entitled to any consideration, what becomes of the entire business of making proprietary articles? What incentive is there to put brains and capital into a business when systematic and undisguised attempts to cheat you out of your profits are not merely excused, but justified?
>
> A dealer is not under the least obligation to keep a particular line of goods. If, in his opinion, the goods are worthless or the advertising a mess of lies, let him act according to his conscience. But, when he keeps an article on his shelf, he is bound to supply it to whomsoever demands it, and he is bound not to press a substitute upon the customer.
>
> Imagine that the Pharmaceutical Era is widely advertised. A druggist asks for a copy at a news stand, and the dealer urges him to accept another publication as "just as good." This is done not in one case, but in fifty—not one day, but every business day in the year. How long would the Era stand this sort of thing?

According to our esteemed contemporary's arguments, if a man opened a first-class hotel he would have a case of damages against the public if it didn't patronize him. It seems to overlook the fact that one going into the patent medicine or any other line of business, must take the business risk of his venture, and because he spends his money liberally, the trade or the public is under no obligation to see that his venture is a success. If the newsdealer had to sell Eras with little or no profit, or if he could make more money by selling some other drug journal, while the publishers of the Era might object, they certainly would have no legal right to interfere with that newsdealer's business, and it would be the publishers' duty to make it an object for the newsdealer to handle the Era if they wanted his trade.

If, instead of complaining so much about losing the business which they claim is justly theirs, these patent medicine proprietors would devote more of their energy to satisfying the dealers who handle their goods, the results would, in our opinion, be more gratifying to these proprietors. Self-gain is the stimulus for all business enterprises. Retail druggists are not in business for their health or for the good of the community, any more than are the proprietors. Druggists hope to make at least a living, and some of them hope to make a little more. They are certainly very foolish to handle patent medicines, or any other goods, if they cannot make money upon them. If a druggist loses trade by doing this, that is his loss; nevertheless, he is boss of the establishment, and it is his right to sell or to refuse to sell whatever he pleases.

One great difficulty in this problem, which our newspaper friends perhaps do not fully appreciate, is the large margin of profit between the original cost of the goods to the manufacturer and his selling prices, and the druggist's technical knowledge of medicines and what they cost. We all understand that a patent medicine man must have a large margin to pay for his advertising bills, but this same margin is what stimulates competition and what gives others a chance to take advantage of his advertising. His aim should be to control and satisfy the dealers; then his advertising will not be side-tracked. The only way he can satisfy his dealers is by compelling them to make a margin on his goods, and not permit them to ruin his trade by cutting. This is an individual matter for each proprietor to solve for himself, and we do not believe it is more difficult for a patent medicine manufacturer to compel the retailers to sell his goods at a certain price than it is for Earl & Wilson to compel the haberdashers to sell their collars and cuffs at a specific figure, or for the Ansonia Clock Company to require all department stores not to go below a certain price on each clock, or for Huyler to make his agents sell his candies at a uniform schedule. If the manufacturer fails to keep the retailers in line, they are sure to cut each others' throats, and when the article has lost its charm of profit will turn their attention to something else.

Recommending a Medicine is Prescribing.

An Ohio judge has decided that the selling and recommending of a medicine by a druggist is in fact prescribing for a disease and hence practicing medicine without a license. The case was one brought by the State Medical Board, and in which a druggist had to pay $50 and costs for handing out a bottle of medicine and saying it was good for the disease from which the customer said he was suffering. The customer did not even state the symptoms or get a diagnosis of his case. The druggist said he made the medicine himself and had a large call for it. The judge stated that many druggists were violating the law by selling medicines which they said were good for this and that.

If the medicine and pharmacy laws are to be rigidly construed, the judge's position is undoubtedly correct, but this spasmodic, individual application of the principle at issue can effect but little good. Carried to its legitimate conclusion the entire trade in proprietary medicines would be stopped. But the laws are inconsistent, and this inconsistency is made specially apparent in this instance. This druggist is not allowed to recommend an article of his own make, whose virtues he knows, but he is permitted (by special exception in law) to sell and recommend, if he will, the whole brood of secret concoctions, patent medicines, exploited by rhetorical claims of high sound, of superlative adjectived pretensions, guaranteed and recommended by their manufacturers to cure every ill to which human flesh is heir.

But it is all only one phase of that old question, that bone of contention, counter-prescribing. How far can the druggist go and be within the bounds of law, ethics and common sense? When the doctors think a druggist is overstepping the bounds, they bring suit against him, and it all depends upon the evidence whether conviction follows. We do not know for what class of diseases this particular druggist prepared and recommended his medicine, but it is upon this very point that the justice or injustice of his conviction would hinge. The druggist has certain rights in the matter of prescribing for simple ailments, and emergencies, but he must not intrude where competent medical training is requisite for diagnosis and treatment. Law and justice must consider carefully this point when passing upon the character of his acts.

Ohio Blackmailers on the Run.

Mr. Horatio N. Fraser has won a legal and moral victory upon which both he and the drug trade, the latter especially, are to be warmly congratulated. Honest men everywhere will take him by the hand for his success. He has expended six weeks of time and some thousands of dollars to drive into banishment a corrupt official and to put away in jail the besmirched tool of that official. It is his moral courage upon which he is to be congratulated, and the reason for congratulation of the trade lies in the fact that it has men who will not submit to blackmail for the sake of business considerations. The contest has not been merely like an ordinary, modern, amateur sporting event, to prove the superior strength and endurance of the winner; it rather resembles those romantic combats of chivalry when the fate of hostile armies hung on the issue. Mr. Fraser represented an element from which blackmailing officials everywhere seek their plunder; but in this case they mistook their man; the business element thus represented was not the soft thing it often is, but put up a winning fight. Prendergast and Limerick and all the rest of the hungry horde which has made the name of Ohio a reproach throughout the commercial world, have received a lesson whose salutary effects will be felt for a long time to come. There have been other bribery cases in Ohio, but this was one without a taint of politics. There will be no more demands for hush money, at least at present, on reputable New York and other manufacturers and wholesalers in the drug trade; no more attacks on honest goods. Let us congratulate one another that such a champion as Mr. Fraser has fought and won such a battle for us.

The Gentleman with the Pitchfork.

An incident of more than passing interest to South Carolina pharmacists is the sale in a regular State dispensary down there of adulterated blackberry brandy for medicinal use. An official analysis has proved it. This is a pretty hard blow in view of the fact that the whole excuse for the dispensary law as advocated by Governor Tillman is to furnish the people with pure liquor. According to the new gospel loudly proclaimed by Governor Tillman, the crying dishonesty of our times is centered in Wall street. There is an older and more universally accepted belief that fraud is not immaculate. Even a Tillmanite will probably admit that when the State of South Carolina sells adulterated liquors for sick folks there is boodling going on somewhere, and that it is shameful, no matter who profits by it.

However, the reform of the universe is a greater matter than the reform of the South Carolina dispensaries. After Mr. Tillman has paved Wall street with silver, it is to be hoped that he will take his pitchfork in hand and dig to the bottom of this scandal, which has developed in Mayesville, S. C. Most druggists can do better than this dispensary has done.

The Fate of a Reformer.

This is a skeptical world, and the fate of the reformer is generally that of the martyr. Crucify him is the cry. All great discoveries, all great reforms have had to encounter bitter opposition, and indomitable courage and persistence born of conviction have been necessary to bring them to acceptance. In medicine is this particularly true. Did you ever hear of more rancorous opposition than the doctors present when one of their number modestly claims he can cure this or that mortal disease? Is it jealousy or ignorance? But our sympathies are with this opposition, though not with the manner of its expression. Festina lente is a good motto for doctors sometimes. We are very glad they are slow to believe that the way to cure consumption is to burn the patient's lungs out. Also do we feel safer to learn that this method of treatment is apt to lodge its practitioner in durance vile. The news comes over the wire that a Denver specialist is charged with the murder of a patient upon whom he tried his new cure for consumption, which consists in inserting a trochar into the lungs at a point where a cavity is supposed to be. Through this hollow tube a loop of platinum wire is inserted. Connected with the loop are the wires of a powerful electric battery, and when the current is on the loop takes on a white heat, which is supposed to kill the germs within the lung cavity. The patient did not survive the operation. This boring a hole in a man and burning him out is carrying things a little too far. So in this particular case, we would be glad to learn that the reformer has come (or will come) to the end of his rope.

Be Decent.

A Massachusetts paper says that "certain druggists are offending the proprieties by displays made in their windows. Setting aside the question of good taste, this is bad business policy. It drives away trade, as sensible men ought to be able to understand." We can thoroughly indorse this sentiment. No advertising is good advertising which is vulgar or of double entente, to say nothing of the kind bordering on the indecent. The druggist particularly cannot afford to violate the canons of good taste in this regard.

A Newspaper on Substitution.

Some of the big manufacturers of patent medicines are getting almost hysterical over the substitution of other goods for their widely advertised products and are sending circulars and letters to wholesalers and jobbers asking them to do something to prevent it. No doubt it is annoying to these magnates to see others reaping a large share of the benefit of their tremendous expenditures in advertising, but without advertising neither they nor their competitors would sell a tithe of the goods which they now put out. Some of the large sarsaparilla concerns spend over half a million dollars annually in various departments of publicity, and the druggists who are supplied with "syndicated" sarsaparillas, with their own names on them, receive many returns by supplying this preparation when the extensively advertised article is called for. Except in the very finest moral sense we cannot see why this is not a legitimate proceeding if the product supplied the customer is as good as that called for and the price is no higher. We are of the belief that in many instances the substituted article is far superior to that sought, and even if the dealer makes a little more profit has he done anything irregular? There is no fine point involved, but generally speaking we think the dealer cannot be blamed for looking after his own interests, if he also treats his customer fairly, any more than the great manufacturer who has become immensely wealthy by selling his goods everywhere possible instead of allowing his rival manufacturers to sell theirs.—Editorial in the Mirror, Danvers, Mass.

Not A. Ph. A. But U. S. Delegates.

Baltimore, June 4, 1897.

To the Editor.

On pages 667 and 671 of yesterday's issue of the Era occurs a statement in regard to this association which requires correction. The A. Ph. A. has not appointed any delegates to represent it at the coming 8th Int. Pharm. Congress, but at the request of the U. S. Commissioners to the Brussels Exposition the Council authorized the president, Mr. J. E. Morrison, to suggest to them the names of four gentlemen to represent the U. S. Government at the 8th I. Ph. Congress. The gentlemen named by President Morrison were confirmed by the Department of State and certificates of appointment, signed by Secretary Sherman, were sent to them through me. The appointees are Joseph P. Remington and Louis Dohme, delegates; Frederick B. Power and Alfred Meyer, alternate delegates.

I am glad to be able to give you the correct facts in the case. Yours truly,

CHAS. CASPARI, JR.

JUBILEE SPECIALTIES.

This is a great year for the display of patriotism and loyalty by our British cousins, for it's jubilee year. Everything is jubilee and pharmacy is not exempt. This jubilee enthusiasm is a good thing, and so are the jubilee specialties which we find formularized in a recent issue of the Chemist and Druggist, as below:

Jubilee Pomade.

Jasmine pomade	4	ounces
Lanolin	4	ounces
Butter coloring	2	drams
Benzoated lard	16	ounces
Rose water	3	ounces
Spirit of rose	1	ounce
Oil of ylang ylang	½	dram

Mix the butter coloring with the lanolin, incorporate the rose water and spirit of rose, and add gradually the jasmine pomade and lard previously melted on a water bath and allowed to cool to a creamy consistence.

Jubilee Boquet.

Oil of cloves	2	drams
Alcohol	2½	pints

Mix and add

Oil of bitter almonds	12	minims
Oil neroli. super.	16	minims
Oil cinnamon, true	24	minims
Otto rose	1	dram
Oil lemon	1	ounce
Oil bergamot	1	ounce
Essence millefleurs	1	ounce
Essence violet	1	ounce
Essence jasmine	1	ounce
Essence musk (1 scru. to 2 ounces)	1½	ounces
Oil lavender, Eng.	1	ounce
Essence ambergris	1½	ounces

Macerate 4 weeks, color with extract cannabis indica, and filter.

Jubilee Dentifrice.

Precip. chalk, powd.	2½	pounds
Cuttlefish bone, powd.	4	ounces
Magnesium carbonate, heavy	4	ounces
Orris root, powd.	3	ounces
Carmine	1	dram
Otto rose	1	dram
Musk grain	3	grains
Oil ylang ylang	20	minims
Oil verbena	5	minims
Oil eucalyptus	5	minims
Oil neroli.	5	minims

Mix and pass through a fine sieve several times. The musk should first be rubbed up with a little of the precipitated chalk.

Jubilee Brilliantine.

Extract Indian hemp.	2	grains
Absolute alcohol	2	ounces
Ionone	20	minims
Otto rose	5	minims

Dissolve, filter and add

Almond oil	10	ounces

Mix.

Jubilee Sauce.

Powdered cayenne	3	ounces
Malt vinegar	4	pints
India soy.	5	ounces
Walnut catsup	4	ounces
Mushroom catsup	4	ounces
Tomato catsup	4	ounces
Garlic, bruised	1	ounce
Shallots	1	ounce
Port wine	1	ounce
Brandy	1	ounce

Eight large anchovies carefully selected and lightly bruised.

Macerate eight days, shaking the bottle occasionally, and strain through a coarse sieve.

If we may judge from the many newspaper accounts, the credit for unearthing and running down the Chicago gang of patent medicine counterfeiters belongs individually to and is claimed by each of a half dozen concerns, though how can this be? But what's the use of squabbling over it? The result's the thing.

(*Continued from Page 607, April 29.*)

*LIST OF REACTIONS AND REAGENTS ACCOSDING TO NAMES OF AUTHORS.***

SKRAUP'S—Test for Thalline.—When treated with oxidizing agents, as chromic acid, bromine, iodine, mercuric nitrate or ferric chloride, thalline gives an emerald green.

SMITH'S—Test for Biliary Colors (Maréchal's Test).—Tincture of iodine is allowed to flow slowly into a test tube containing the sample of urine, the two fluids forming layers and at the line of contact a coloration ensues. See Maréchal's Test.

SNOW'S—Extractions Fluid.—This mixture, which contains 18 cc. of chloroform, 2 cc. of alcohol, 80 cc. of petroleum ether and 10 to 15 drops of aqua ammonia, is employed in the extraction of colchicin.

SOLDAINI'S—Test Solution for Glucose.—In 1,400 cc. of water, 15 gm. of copper carbonate are dissolved by aid of 416 gm. of potassium bicarbonate. When this solution is boiled with a solution of glucose, reduction to suboxide of copper takes place. Compare "Ost's Copper Solution."

SONNENSCHEIN'S—Alkaloidal Reagents.—I. Chlorine gas is passed into a mixture of suspended cerous hydroxide and potassium hydrate solution until the yellowish brown colored cerous ceric oxide results; this is then washed and dried.

The alkaloid is dissolved in concentrated sulphuric acid and a trace of cerous oxide added; concerning the color reactions produced see Hager Pharm. Praxis, I. 207.

II. (Phosphomolybdic Acid).—A solution of ammonium molybdate in nitric acid is precipitated with phosphoric acid, the precipitate washed and then boiled with Aqua Regia till all of the ammonia is driven off; the residue is then dissolved in 10 per cent. nitric acid. This reagent gives a yellow precipitate with alkaloids in slightly acidified solutions; the same also occurs with ammonia and a few other bases. Compare Jungmann's Test.

SOUCHERE'S—Test for Ground Nut Oil (Arachis).—The isolated fatty acids are dissolved in boiling alcohol; if arachis oil is present, its fatty acid will separate on cooling in crystals, which refract the light like mother-of-pearl.

SPICEA'S—Test for Salicylic Acid (in Wine).—The residue of the ether extract of the wine examined is warmed with concentrated nitric acid, and then supersaturated with ammonia; if salicylic acid is present, it is converted by this procedure into picric acid, which may be recognized by its property of staining wool yellow.

SPIEGLER'S—Albumen Reagent.—This consists of 8 gm. of mercuric chloride, 4 gm. of tartaric acid, 200 gm. of water, and 20 gm. of glycerin. The sample of urine is acidified with acetic acid; any separated mucin removed by filtration and to the filtrate the reagent is added to form two layers; at the line of contact a white zone forms if albumin is present. If the urine sample contains iodine, a yellow flocculent precipitate forms in the zone, which is soluble in alcohol. The delicacy of this reagent depends on the presence of chlorides in the urine. Rafaele accordingly proposed the employment of hydrochloric in place of acetic acid in order to cause the formation of chlorides. Jolles offers a reagent which is not influenced by the presence of chlorides.

STAHL'S—Reagent Paper.—This consists of paper which has been impregnated with a 1 to 5 per cent. solution of cobalt chloride. When dry it has a blue color, but becomes reddish when moist, hence can be employed for determining the presence of moisture. Compare Merget's Test.

STAS-OTTO'S—Extractions Test for Distinguishing Alkaloids.—The alkaloids are divided into three groups, of which the members of the first group are taken up by ether from their acid aqueous solution; the members of the second group are extracted by ether from alkaline solution, while the third group (morphine) is not taken up by the above solvent.

STENHOUSE'S—Caffeine Test.—Caffeine solution is heated for a few minutes with fuming nitric acid, then evaporated to dryness, and the residue moistened with ammonia, whereby a purple coloration similar to the murexid reaction results, which disappears on the addition of caustic potassa. The murexid coloration changes to blue under these circumstances.

STORCH'S—Test for Rosin Oil in Mixed Oils.—One to two cubic centimeters of the sample are shaken with 1 cc. of acetic anhydride, the mixture is allowed to stand, the acetic anhydride is drawn off and added to one drop of concentrated sulphuric acid, whereby a violet-red coloration results if a rosin oil is present. Morawski recommends in place of concentrated sulphuric acid one of gravity of 1.53.

STRASSBURG'S—Test.—See Pettenkofer's Test.

STRUVES—Test for Blood.—The suspected spots are extracted with dilute potassium hydrate solution, the solution filtered and treated with tannin. If blood is present the solution takes on a red brown color, which upon acidifying with acetic acid gives a precipitate which upon washing and treating with acetic acid and sodium chloride yields hæmin crystals (See Selnir's Test, also Teichmann's hæmin crystals). Under the same circumstances, urine containing blood gives a reddish precipitate.

STUTZ'S—Albuminoid Reagent Capsules.—These capsules contain Fuerbringer's reagent.

TANRET'S—Albuminoid Reagent.—Potassium iodide 3.32 gm. and mercuric chloride 1.35 gm. are dissolved in 20 cc. of acetic acid, with water sufficient to make 60 cc. This reagent causes a white precipitate to form in urine containing albumin; this precipitate is insoluble in acetic acid; with peptones a precipitate is formed which dissolves on boiling; alkaloids give a precipitate which is soluble in alcohol. Compare Mayer's Alkaloidal Reagent.

TATTERSALL'S—Morphine Test.—Upon adding sodium arsenate to a solution of morphine in concentrated sulphuric acid, a dirty violet coloration ensues which changes to a sea green. Under like treatment codeine gives a blue color.

TEICHMANN'S—Hæmin Crystal Test for Blood.—To 2 to 3 cc. of an aqueous solution of blood (not too dilute) a few drops of glacial acetic acid are added, with a trace of sodium chloride (0.01 gm.). A few drops of this solution are allowed to evaporate upon an object glass, when it is examined under a lens for hæmin crystals, which form rhombic needles or plates of a brownish-red to black-brown color.

THENARD'S—Test for Aluminum Compounds.—Aluminum oxide, when fused with a solution of cobalt, gives Thénard's Blue.

THOULET'S—Solution.—This is a solution of 1 part of potassium iodide and 1.239 parts of mercuric iodide in water, which has been evaporated until a scum forms upon the surface. The solution has the specific gravity of 3.196, and is used for the mechanical separation of various constituents of a mineral powder. Compare Klein's Solution.

THRESH'S—Alkaloidal Reagent.—A solution of 1.8 gm. of potassium iodide in 45 cc. of hydrochloric acid and 30 cc. of a solution of bismuth (Liq. Bism. et. Ammon. cit. Ph. Br.) This bismuth solution is prepared by dissolving 2.5 gm. of bismuth in 70 gm. of nitric acid, adding 60 gm. of citric acid, then making slightly alkaline with ammonia, adding water to 600 cc.

This reagent gives with alkaloids a red-brown coloration and precipitate.

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* From compilations of Dr. Altschul (Phar. Centralhalle).

TOCHER'S—Test for Sesame Oil (Mod. Baudouin's). In 30 cc. of hydrochloris acid (119) 2 gm. of pyrogalol are dissolved and 15 gm. of this solution shaken with a like volume of the oil. The mixture is allowed to stand until it has separated into two layers, then the aqueous fluid is drawn off by means of a pipette and warmed for 5 minutes; if sesame oil is present a blue-red coloration ensues.

TOLLEN'S—Test for Formaldehyde.—This is an ammoniacal solution of silver nitrate. This reagent is reduced with formation of a silver mirror.

TOLLEN'S—Reagent for Glucose.—A solution of ammoniacal silver nitrate obtained by precipitating a solution of silver nitrate with potassium hydrate and adding sufficient ammonia to dissolve the precipitate. This solution is reduced by glucose.

TOMMASI'S—Phenol Reaction.—See Hoppe-Seyler's Phenol Test.

TOPPING'S—Microscopic Mounting Fluid.—This consists of a mixture of 1 part of absolute alcohol and 5 parts of water or in place of the latter 4 parts of water and 1 part of aluminum acetate may be used. This solution is mixed with an equal volume of glycerin before using.

TRAUB'S—Reagent for Detection of Hydrogen Peroxide.—This consists of a solution of zinc iodide of starch, to which solutions of copper sulphate and a ferrous salt are added.

TRAPP'S—Veratrine Test.—On boiling veratrine with concentrated hydrochloric acid a permanent purple-red color is produced.

TROMMER'S—Test for Glucose.—To a dilute solution of grape sugar (urine) one to two drops of copper sulphate solution are added, followed by 5 cc. of sodium hydrate solution; if grape or diabetic sugar is present, the precipitate dissolves, and when the solution is boiled suboxide of copper precipitates. Compare Fehling's Solution.

When examining urine for sugar, it is first made alkaline with sodium hydrate solution, then the copper solution is added drop by drop until some cupric hydrate remains undissolved; then the solution is boiled; if glucose is present, reduction to yellow cuprous oxide takes place.

Focke proposes for removing the reducing substances (not sugar) the following procedure: To 10 cc. of the urine, 5 cc. of a solution of copper sulphate (1 : 10) are added, the mixture boiled, and to the cooled filtrate 2 cc. of a solution of sodium carbonate (1 : 10) added; after standing, the fluid is filtered and the filtrate tested according to Trommer. Compare Johnson's Test.

TROTARELLI'S—Test for Ptomaines.—On adding sodium nitroprusside, followed by palladium nitrate, to a solution of the sulphates of the ptomaines, various color reactions result.

TROTARELLI'S—Alkaloid Test.—On evaporating with concentrated nitric acid to dryness and then treating the residue with alcoholic potassium hydrate, various alkaloids give characteristic colorations. Compare Vitale's Test.

TSCHEPPE'S—Alcohol Test.—To the fluid to be tested 70 per cent. nitric acid is carefully added, so as to form a supernatant layer; if alcohol is present a slight evolution of gas takes place at the line of contact, and the odor of ethyl nitrite is perceptible.

TUCHEN'S—Test for Volatile Oils.—Many volatile oils give a slight explosive reaction. When 4 to 6 drops are brought into contact with 0.1 gm. of iodine.

UDRANSKY-BAUMANN'S—Test for Polyvalent Alcohols.—Baumann's test with benzoyl chloride and sodium hydrate is used (vide). Since diamines also give this reaction, they must be proven to be absent by Molisch's Furfurol Test.

ULTZMANN'S—Test for Biliary Colors.—With ferric chloride solution, 0.4 gm. of alcohol, and 100 gm. of water. This reagent is decolorized by hydrochloric acid; with lactic acid a yellow color is produced, and with butyric acid a milky turbidity results.

ULTZMANN'S—Test for Biliary Colors.—With 10 cc. of urine 3 to 4 cc. of potassium hydrate solution (1 : 3) are mixed and shaken; then the mixture is saturated with pure hydrochloric acid. If biliary colors are present, the mixture takes on an emerald green color.

VALENTA'S—Test for Fats.—Equal volumes of fat and glacial acetic acid (1.0562 sp. gr.) are intimately mixed in a test tube, and if solution does not take place the mixture is warmed. The oils are divided into three classes, according as solution takes place in the one, or a higher temperature up to that of boiling is necessary in the second, or in the third solution is not complete. In the case of those oils which dissolve by heat, the temperature is noted at which the cooled mixture becomes turbid. According to Bach the same observations carried out with the separated fatty acids and David's alcohol-acetic acid (vide) give reliable data.

VALENTINE'S—Test for Fuchsine.—When shaken with a solution of fuchsine, ether is not colored, but if ferrous iodide is added the ether is colored violet.

VALSER'S—Reagent.—This is potassic-mercuric iodide.

VAN DEEN'S—Test for Blood.—On adding a few drops of freshly prepared tincture of guaiac and ozonized oil of turpentine to a well diluted solution of blood, a blue color is produced.

VETERE'S—Test for Castor Oil.—See Di Vetere's Test.

VILLAVECCHIA AND FABRI'S—Test for Sesame Oil.—This is a modification of Baudouin's Test. The reagent consists of a solution of 2 gm. of furfurol in 100 cc. of alcohol; 10 cc. of the sample of oil are shaken for one-half minute with 0.1 cc. of the reagent and 10 cc. of hydrochloric acid (1.19 sp. gr.); a red coloration shows presence of sesame oil.

VILLIERS AND TAYOLLE'S—Test for Hydrochloric Acid and Chlorine.—Traces of chlorine give, with an acid solution of aniline (400 cc. of a saturated aqueous solution of aniline, with 100 cc. of glacial acetic acid,) a brown to black precipitate; with a solution of aniline containing ortho-toluidine (100 cc. of a saturated aqueous solution of aniline with 20 cc. of a like solution of ortho-toluidin and 30 cc. of glacial acetic acid,) a blue color is produced; with the above mixtures bromine gives a white precipitate, iodine does not give any reaction. From solutions containing the halogen acids, the halogens may be liberated for this purpose by heating with dilute sulphuric acid and potassium permanganate.

VIOLETTE'S—Solution for Testing for Glucose.—Identical with Fehling's solution.

VITALI'S—Alkaloidal Test.—The alkaloid is evaporated to dryness on a water bath, with fuming nitric acid; then when cold the residue is moistened with alcoholic potassium hydrate. Atropin gives a violet; strychnine, with a trace of alkali, a reddish-yellow color, with a slight excess of alkali a red-violet coloration is produced.

VITALI'S—Test for Blood.—The suspected spot is exhausted with potassium hydrate solution, acidified with acetic acid and tincture of guaiac added. If a blue coloration does not take place within one-half to two hours, oil of turpentine or eucalyptus is added, whereby a blue coloration takes place at once if blood is present.

ITALI'S—Test for Biliary Colors. See Gmelin's test.

VITALI'S—Test for Chloroform.—Pure hydrogen gas is passed through water and then a tube, the tip of which is provided with a mantle of platinum. The flame of this gas is colorless; it also does not give a colored flame when a copper wire is held in it. If the fluid to be examined is poured into the water through which the gas passes, the flame will give a green color with the copper wire, caused by the presence of volatile halogen (chlorine) compounds.

VITALI'S—Test for Martius' Yellow (Butter Color) in Urine, etc. 1.The ether extract of the fluid to be examined, when treated with a solution of potassium cyanide, gives a red coloration if Martius' yellow is present.

If the ether extract is shaken with potassium hydrate solution, and then the latter acidified, wool which has been treated with a solution of alum, will take on the same shade of Martius' yellow if one millionth part of the latter color is present.

2.) Solutions of Martius' yellow givee, with cobalt chloride and potassium hydrate, a green lake.

3.) The same solution, when treated with stannous chloride and aqua ammonia, gives a white precipitate which turns a rose color upon the further addition of ammonia.

VOGL'S—Test for Glucose.—See Mulder's test.

VOGL'S—Test for Quinine.—On adding chlorine water and potassium ferricyanide to a solution of quinine, a red coloration ensues.

VOGL'S—Test for Chenopodium Seed in Flour.—Flour which contains chenopodium gives a rose to red coloration when allowed to stand for several hours in contact with alcoholic hydrochloric acid.

VRY'S—Quinine Test.—See De Vrij's quinine test.

VULPIUS'—Test for Acetanilid.—A few centigrammes of acetanilid are boiled with 1 cc. of potassium hydrate in a test tube; then over this is held a glass rod which has been moistened with a filtered 1 per cent. solution of chlorinated lime. The solution on the rod is colored yellow, which on further heating turns violet.

VULPIUS'—Sulphonal Test.—Sulphonal when heated with potassium cyanide gives an odor of mercaptan; the fused mass gives with ferric chloride a red coloration.

WAGNER'S—Alkaloidal Reagent.—This is a solution of iodine in potassium iodide ($\frac{N}{10}$ normal iodine solution), which gives a brown precipitate with alkaloids.

WAGNER-FRESENIUS'—Solution.—This is a solution of iodine in potassium iodide.

WAYNE'S—Glucose Test Solution.—A solution of 2 gm. of copper sulphate, 10 gm. of caustic potassa and 10 gm. of glycerin in 200 gm. of water; glucose reduces the diluted solution on warming, with the production of red cuprous oxide.

WEBER'S—Test for Blood.—The fluid containing blood (urine) is mixed with one-half of its volume of glacial acetic acid and then shaken with ether; the ether is drawn off and a few drops of resinified oil of turpentine and fresh guaiac tincture (1 : 10) added. If blood is present, a blue coloration results. Compare Almen's Reagent.

WEIDEL'S—Test for Xanthin.—Xanthin, when evaporated with chlorine water and a trace of nitric acid, gives a yellow residue which turns a deep yellowish-red with ammonia.

WEIGERT'S—Bacteria Staining Fluid.—From 2 to 4 gm. of methylene blue (or 2 gm. of fuchsine or 2 gm. of Victoria blue) are dissolved in 15 cc. of alcohol, then the solution is diluted with 85 cc. of water.

WEISSMANN'S—Acid Mixture.—This mixture, which is employed for dissolving iron samples, consists of a mixture of 10 vols. of concentrated nitric acid, 2 vols. of concentrated sulphuric acid, and 10 vols. of water.

Ulzer and Bruell add some concentrated hydrochloric acid during the evaporation.

WELMANN'S—Test for Vegetable Fats.—The reagent is prepared by dissolving 5 gm. of sodium phosphomolybdate in water, adding concentrated nitric acid and diluting to 100 cc.

Test: 1 cc. of the fat is dissolved in 5 cc. of chloroform and shaken with 2 cc. of the reagent for one minute.

If vegetable fats or oils are present (excepting cocoa fat) a green coloration ensues, which is changed to a blue upon the addition of ammonia.

WENDER'S—Test for Glucose.—See Neumann-Wender's test.

WENZEL'S—Alkaloidal Reactions.—Alkaloids give various color reactions with a solution of 1 gm. of potassium permanganate in 200 gm. sulphuric acid. Veratrine gives a bright red, followed by an orange precipitate, with this reagent.

WEPPEN'S—Veratrine Test.—A small quantity of veratrine is well mixed with about six times its bulk of powdered sugar, and concentrated sulphuric acid added; first a yellow, then green, finally a blue coloration is produced.

Neumann-Weder recommend in place of cane sugar and sugar and sulphuric acid a solution of furfurol in sulphuric acid. Morphine and codeine produce with both reagents evanescent red colorations.

WESELSKY'S—Reagent.—This consists of nitric acid which has been saturated with nitrous in the cold.

WESELSKY'S—Test for Phloroglucin.—On adding toluidin nitrate and potassium nitrite to a solution of phloroglucin, first a pale yellow color is produced; this is then followed by an orange and cinnabar red. When well diluted the precipitate remains suspended; if precipitation takes place, the fluid remains an orange, while the precipitate is of a cinnabar red. Phloroglucin in dilution of 1 : 200,000 can be detected by this test.

WEYL'S—Test for Creatinin.—On treating urine with a weak solution of sodium nitroprusside, followed by sodium hydrate, a ruby red coloration is produced, which passes into yellow if creatinin is present. The presence of other sulphur compounds destroys the efficacy of the test.

Salkowsky adds acetic acid and boils after the solution has taken on the yellow color; this causes the solution to turn blue with the separation of a precipitate of Berlin blue.

WICKERSHEIMER'S—Preservative Fluid.—This consists of a solution of alum 100 gm., sodium chloride 25 gm., potassium nitrate 12 gm., potassium carbonate 66 gm., arsenous acid 20 gm. in 3 liters of water.

WIEDERHOLT'S—Test for Genuine Rum and Cognac.—To 10 cc. of the sample 3 cc. of concentrated sulphuric acid (1.84) are added; after cooling the well shaken mixture, it will lose its odor if the rum is artificial; the odor of genuine rum is not disturbed by this test.

When a few drops of diluted ferric chloride solution are added to a sample of genuine cognac a black precipitate forms; artificial cognac does not give this reaction; occasionally a slight precipitate of off color is produced.

WIESNER'S—Test for Wood Fiber.—The reagent consists of an acid solution of aniline sulphate, which stains tissue that contains wood fiber a golden yellow. Pure cellulose is not colored. Another reagent known by the same title is a one-half per cent. solution of phloroglucin, which, in conjunction with hydrochloric acid, stains wood fiber a violet.

WOLESKY'S—Test for Wood Fiber in Paper.—To the sample of sulphuric acid a small particle of resorcin is added, with 5 cc. of water, and the mixture shaken; if nitrous acid is present, a yellow color is produced.

WINCKLER'S—Reagent.—See Mayer's reagent.

WOLESKY'S—Test for Wood Fiber in Paper.—To 5 to 6 cc. of hydrochloric (concentrated) or sulphuric acid a solution of 1 gm. of diphenylamine in 50 cc. of alcohol is added. A sample of paper when moistened with this reagent will give a more or less intense orange-red coloration, according to the proportion of wood fiber present.

WOLFF'S—Test for Naphthol.—When alpha or beta naphthol is dissolved in alcoholic potassium hydrate and heated with chloroform (50° C.), a clear, blue solution results, which turns a red with hydrochloric acid.

WORM-MUELLER'S—Glucose Test.—This solution is a modification of Fehling's test and consists of two separate liquids, namely, a 2½ per cent. solution of copper sulphate and a 10 per cent. solution of rochelle salt containing 4 per cent. of sodium hydrate solution. Five cc. of the sample of urine on the one hand and a mixture of 1 to 3 cc. of the copper solution with 2.5 of the rochelle salt on the other, are each heated to boiling, then mixed without agitation. If glucose is present a reduction of the copper takes place.

WRIGHT'S—Test for Aconitin.—A trace of aconitin is stirred up with a few drops of a moderately concentrated syrup, then a drop of concentrated sulphuric acid is added, at the line of contact a rose-red zone forms which is quickly followed by a dirty violet and brown.

WURSTER'S—Albumin Test.—This is a modification of Silbermann's test, in which the concentrated hydrochloric acid is replaced by a mixture of the same with 1-10 to 1-5 of its volume of concentrated sulphuric acid.

WURSTER'S—Tetra Test Paper for Ozone and Hydrogen Peroxide.—Filter paper is impregnated with tetra-methyl-para-phenylene-diamine, this takes on a blue color with a neutral or acetic acid solution of ozone or hydrogen peroxide.

The tetra-methyl compound can be replaced by dimethyl-para-phenylene-diamine.

YOUNG'S—Test for Gallic in Tannic Acid.—This test depends upon the addition of potassium cyanide which gives a red coloration with gallic acid and none with tannic acid. According to Stahl the reaction depends solely upon the alkalinity of potassium cyanide.

YVON'S—Test for Alcohol in Chloroform.—The reagent consists of a solution of potassium permanganate 1 part and caustic potassa 10 parts in 250 cc. of water. When this reagent is shaken with chloroform which contions alcohol its violet color is changed to a green. Official chloroform which contains a small percentage of alcohol also gives this reaction.

YVON'S—Test for Colchicin.—See Paul's Test.

ZACHARIAS'—Reagent for Albuminoids.—This is an acidified solution of potassium-ferrocyanide and ferric chloride.

ZEIL'S—Test for Colchicin.—When a solution of 2 mg. of colchicin in 5 cc. of water is boiled from 1 to 3 minutes with 5 to 10 drops of fuming hydrochloric acid and 4 to 6 drops of a 10 per cent. ferric chloride solution, the yellow-colored solution takes on an olive green, followed by a greenish black. When shaken with chloroform in contact with the air the chloroform takes on a ruby red, while the aqueous fluid turns an olive green.

ZIEL'S—Solution.—See Neelsen's solution.

ZUELZER'S—Albumin Reaction.—This is a zone test obtained by carefully pouring the sample of urine over a concentrated solution of chromic anhydride.

ZEULZER'S—Test for Sugar in Urine.—A solution of copper oxide in sodium hydrate is reduced by diabetic sugar in the cold or on slightly warming.

ZULKOWSKY'S—Starch Solution.—This is prepared by heating starch with glycerin at 190° C., then precipitating with alcohol and dissolving the precipitate in water.

(*The End.*)

LINIMENTUM SAPONIS. (Proceedings Ill. Pharm. Assoc.)

Soap, granulated and dried	70 grams
Water	250 cc.
Dissolve by heat.	
Camphor	45 grams
Oil rosemary	10 cc.
Alcohol	650 cc.
Dissolve, mix the two solutions and add	
Water, to make	1,000 cc.

What one Druggist Said.

A Sidelight on the Substitution Problem.

We read a great deal about substitution. It is painted red, and marked one of the very worst of evils. We are told that it is a kind of stealing—stealing the benefits of the other fellow's advertising efforts. Different remedies are advanced to correct the evil, but the one that will win will be founded upon something besides ethics or moral suasion.

There are some things we know about "substitution." First, it is discouraging to the prospective advertiser to contemplate the fact that after he has built up or created a demand for his particular proprietary article some one else may reap the benefit of his efforts and sell something "just as good." Second, the publishers have a lively interest in this subject. Whatever makes advertising hazardous is calculated to reduce the volume of business. Third, substitution does exist and goes merrily on each day. The more generally a remedy becomes known, the greater skill is employed in placing a substitute upon the market. Fourth, the one and only reason why the substitute is offered lies in the fact that the increased profits award the substituter. Fifth, advertising appropriations have been reduced on account of these conditions, and therefore substitution is a direct menace to the advertising business.

These facts are well known. Now, then, what are we going to do about it?

As the matter of substitution is one I have studied from the advertiser's standpoint, I determined to view it from the vantage ground of the wicked druggist. I wanted to know what he had to say in justification of his unholy practice. Armed with a very pious air, I entered the drug store of a personal friend. In the window he exhibited a lot of celery compound made to imitate one that has a national reputation. Evidently my friend "Smith, the druggist," was flying in the face of Providence and must have a truly dare-devil spirit. He substituted when occasion demanded, seemed to take pride in his sinfulness and advertised his depravity.

I said to him, "Smith, do you consider it honorable to get the benefit of others' investment? Don't you know that the manufacturers of the celery compound that you are substituting have spent thousands of dollars in advertising? Don't you know that you are stealing the benefits of their investment?" Smith looked at me just long enough to satisfy himself that I was in earnest, and said: "Come in, Brown, and have a glass of ice cream soda, and I will tell you all about it. You see, when the manufacturers of that compound were willing to let the dealer have a profit we did not offer a substitute. I don't like to sell substitutes, but am forced to. They charge about $9 per dozen for $1 bottles. After adding for running expenses and freight, we make about 15 cents on a dollar sale. It is not enough. The manufacturers think the advertising will make and continue the demand, and that we will have to pay the price; that they can force us to sell their compound at little profit. When they were willing to let us make a fair profit we did not substitute. Then, when a customer came in and asked for so-and-so's celery compound, we told the customer it was good stuff, and gave him what he asked for. Now we tell him about this other compound, and in nine cases out of ten we sell the substitute. Of course, we keep the genuine, but only order it in half-dozen lots, whereas we used to order three dozen and get the discount. Manufacturers of proprietary articles who are fair and are willing to let the dealer have a decent profit have very little cause for complaint on account of substitutions."

I finished my soda in silence. I had learned something about "substitution." Is not this matter of substitution, to some extent, in the hands of the most interested parties, the manufacturers? Is it reasonable to believe that dealers would care to bother with substitutes if they were able to realize a fair margin on the genuine article?

CHARLES SETH BROWN.
—Printers' Ink.

(Special Correspondence.)

FRENCH PHARMACEUTICAL GOSSIP.

Paris, May 19.—Though the official report has not yet appeared at the moment I write, there seems but little doubt that the disastrous fire at the Charity Bazaar was caused by the employés of the cinematograph while re-lighting their lamp, which had gone out in the middle of a representation.

Bachagrow admits striking a match while Bellac held the unstoppered recipient of ether in his hand. "From the mouth of this recipient," says the Russian, "I saw, during a second, like a stream of lava. A spurt of fire, a bouquet of flame, then an explosion—and already the fire was everywhere, everywhere!"

At the Pharmacist's.

Like the majority of Parisians, I made a pilgrimage to the blackened ruins. Knowing the injured Frenchman's first impulse is to make for a pharmacy, I looked in at Goetzs', "chemist to the King of Hanover," in the Avenue Montaigne. "Yes, we are the nearest to the scene of accident," the assistant told me, "for in this purely residential district, shops are few and far between. We had about fifty patients—nearly all ladies—come to have their wounds dressed. They were all burned on the upper portion of the body—head, neck, shoulders, arms, etc.—the flames fell from above, you know; and were very naturally extremely agitated. We were busy enough for a couple of hours. Some of them were our customers. This quarter of the town has suffered much; there was a funeral just opposite yesterday." "Did anyone die in the shop?" I asked, knowing such things often happen. "No, thank goodness; the police took all serious cases to the Palais de l'Industrie, and we only had those people who were not too much hurt to walk the hundred or two yards which separate us from the scene of the disaster."

I need not describe the death-trap itself, but I must confess I could not repress a smile, in spite of all its horrors, when I noticed a busy bill distributer walking about among the crowd, who thrust into my hand a Rouen pharmacist's advertisement for an "ointment for burns—the only specific."

The Duchesse D'Alencon.

It was Dr. Davenport, the well-known American dentist, of the Avenue de l'Opera, who finally identified the charred and almost unrecognizable remains of the unfortunate sister of the Empress of Austria.

The coffin was brought well into the light in that lugubrious hall of the Palais de l'Industrie; and the doctor, clad in his long, white blouse, knelt beside it, surrounded by officials and anxious relations. After minutely examining each of the teeth, and comparing notes with the memoranda he had taken during his treatment of the Duchess, he finally raised himself and declared: "I absolutely affirm that the corpse before us is that of the Duchess of Alencon."

"Can you swear to it?" asked the two Magistrates present.

"Yes, gentlemen, and without the least restriction," replied Dr. Davenport.

The friends present fell on their knees, while the officials drew up the papers to enable them to remove the body.

Courageous Doctors.

The haste of the men to flee the bazaar, leaving women to their fate, is the theme of all the newspapers just now. A most honorable exception is, however, generally made in favor of the medical profession. Among the only five adult male victims, figure, says a leading weekly, "a glorious general and two doctors, i. e., men used to face death and danger with courage." Dr. Feulard, head of the laboratory at the St. Louis Hospital, Paris, escaped with his wife, but finding his little daughter, Germaine, was still inside the bazaar, he re-entered the flaming building, and fell a victim to his devotion. Madame Nitot, a doctor's wife, also perished in the flames, into which she had returned to seek her little girl; and M. Rochet, a homeopathic doctor on the Boulevard Beaumarchais; Dr. Simon's daughter, Marie Therese, and others were among the victims. The medical profession of Paris organized a special funeral service at the Madeleine, which was largely attended.

Madame Rigaud, wife of the newly-elected Deputy of Neuilly, was at the bazaar, but happily escaped.

The Annual Meeting

of the General Association of French Pharmacists was held at the Paris School of Pharmacy on April 22. Mr. Petit presided, and there was a large attendance to hear his able speech on pharmacy during the last twelve months.

The "Cut Patents" Question Again.

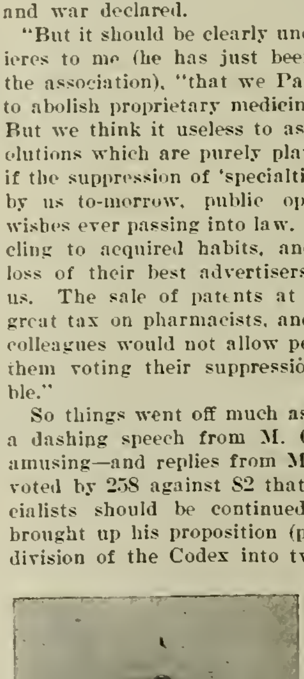
Since the 1896 meeting at Rouen, the advocates of the total suppression of proprietary medicines have continued a vigorous campaign, and the question of securing a fair profit to the retailer was again passionately discussed.

M. Petit and the leaders of the General Association have submitted an anti-cutting scheme to the "Syndicate of Pharmaceutical Products" (dealers in proprietary medicines) which these latter seem disposed to accept if the association can obtain signatures in its favor from the majority of French pharmacists.

All this has taken years to arrange, and M. Collard and his party appear to be under the impression that the "specialists" are merely temporizing, and that—to use a political metaphor—ambassadors should be withdrawn and war declared.

"But it should be clearly understood," said M. Demaizieres to me (he has just been elected vice-president of the association), "that we Parisians are just as anxious to abolish proprietary medicines as M. Codllord himself. But we think it useless to ask pharmacists to pass resolutions which are purely platonic; for it is certain that if the suppression of 'specialties' was unanimously voted by us to-morrow, public opinion would prevent our wishes ever passing into law. Doctors and patients alike cling to acquired habits, and the press—dreading the loss of their best advertisers—would 'go solid' against us. The sale of patents at cost price is, of course, a great tax on pharmacists, and, for my part, I fancy my colleagues would not allow personal interests to prevent them voting their suppression were it really practicable."

So things went off much as they did last year. After a dashing speech from M. Collard—ever eloquent and amusing—and replies from Mr. Petit and others, it was voted by 258 against 82 that negotiations with the specialists should be continued. M. Demaiziéres then brought up his proposition (postponed last year) for the division of the Codex into two portions.



M. Demaizieres.

1. Medicaments to be sold by pharmacists only.
2. Hygienic products salable by all shopkeepers.

The country delegates, however, objected. "Grocers sell drugs enough already. If we give them a complete official list of goods they may sell, they will lay in stock of all, and we shall sell none. Better leave them as they are," said they. And M. Demaiziéres withdrew his motion, explaining he had no personal interest in it, only wished to act for the general good.

Pharmacy Students.

Very interesting was the next discussion, provoked by M. Denize's proposition that the three years of school study should precede (and not follow, as at present,) the three years' shop service.

The majority of those present, while appreciating M. Denize's wish to raise the standard of the profession, feared that the result of this change would be to produce a class of young fellows who would be "above" the somewhat disagreeable work that usually awaits the beginner in a pharmacy. Even at present, it was strongly hinted, the three years "stage" is sometimes a mere farce. When a pharmacist will stoop to sign "certificates of presence" for a lazy assistant, the latter profits by it to shirk all disagreeable work, and absent himself for as many hours a day as possible.

M. Viaud and others insisted on this and other points. The opposite idea seemed to be principally popular among professors and those engaged in teaching. Finally it was decided to leave things as they are for the present; but although the result of this vote is to be duly communicated to all the educational authorities, I should not be surprised to see the subject brought up again later on.

The "Congress."

A man of less vigor and determination than M. Collard would have been crushed by Thursday's vote, but the fact of "never knowing when one is beaten" has opened the road of success to others, and he assures me that in a year or two his party will be in the majority.

The energetic Marseillais had, in fact, convoked a special "congress" for the following day, open to all French pharmacists, and a goodly number gathered in the Salle des Actes, and voted M. Fortune, of Beziers to the chair. This gentleman (who has written some slashing articles against proprietary medicines in the French pharmaceutical press) was supported by M. M. Tujagne (of Toulouse) and Demaizières (of Paris) as vice-presidents, and M. M. Neveu (of Havre) and Collard as secretaries.

In spite of the somewhat Southern character of this little body, the meeting voted (by 175 against 143) that the abolition of "specialties" was undesirable, 79 abstaining from voting. After a lively discussion, it was moved that "all new proprietary medicines shall only be offered for sale after approval by the Academy of Medicine or a School of Pharmacy,"' and this more moderate proposal met with 167 supporters and 152 opponents. It will accordingly be submitted to the Committee on the New Pharmacy Law (which, by the way, seems to make but little progress).

Before dispersing, the "congress" voted two other propositions—one, practical enough, in favor of the establishment of a Disciplinary Committee in each department; the other, more ideal and less likely to be carried out, in favor of limiting the number of pharmacists in France.

And thus ended two stormy, busy days.

Morphinomania Statistics.

M. Rodet has classed a thousand victims of the morphia habit by professions, etc. Some of his figures are worth quoting:

Males—Doctors	40	per cent.
Pharmacists	3	"
Medical students	3	"
Business men	8½	"
Soldiers and sailors	7	"
Workmen	5½	"
Clerks	3½	"
No trade or profession	15½	"
Females—Doctors' wives	10	per cent.
Pharmacists' wives	2	"
Workwomen	14	"
No trade or profession	57	"

Yvette in a New Role.

The Figaro reporter has been interviewing Yvette Guilbert regarding her approaching marriage with Mr. Max Schiller, of New York. "We remain in France," the divette told the pressman. "M. Schiller, who has always interested himself in chemistry is in treaty for the purchase of a manufactory of chemicals near Paris."

And in four years she hopes to have done with theaters "except to take my children to the Theater Guignol!"—(Punch and Judy).

SPRAYING MIXTURES AND THEIR APPLICATION.*

BY F. H. HALL.

Elementary instruction concerning the materials, appliances and methods used in spraying still seems to be demanded. Experiment stations and periodicals have done much to scatter broadcast the principles governing the use of fungicides and insecticides in spray form, and prominent growers of fruits and of garden crops have made practical application of these principles to their own financial gain; yet many still inquire: How shall we spray? Some of the more important features involved in this method of treatment are here reviewed.

It is not wise to spray just because spraying is a good thing or because by it a neighbor has saved the crops of his garden or orchard. The pests which troubled him may have passed away and an entirely different sort may have taken their place. The crop must be carefully examined, and if injury is detected its character and cause must be determined before it can be effectively treated. Judgment and care must be exercised, for no set of rules or spray calendar is a sufficient guide. It is essential to know why to spray, what to use and how to apply the remedy. It would be useless to spray with kerosene emulsion to repress mildew, to combat currant worms with Bordeaux mixture or to apply Paris green for an attack of plant lice.

Bordeaux mixture is a fungicide, and is used to prevent plant disease; Paris green and kerosene emulsion are both insecticides; but they are useful against very different classes of insects. The former poisons the beetles and worms that eat the foliage, while the latter kills, by contact, the lice and scales and other insects that pierce the plants and suck their juices. A little careful study will soon enable one to recognize the plant foes he is most liable to meet. Then it becomes necessary to know how to make the appropriate remedy and how best to apply it.

The Bordeaux mixture which this station uses, and which has proven highly satisfactory, consists of four pounds of copper sulphate, 3 pounds of fresh lime and 45 gallons of water. The sulphate dissolves readily in a few gallons of hot water or by suspending it for a longer time in a coarse bag in cold water. The solution is then diluted to about 30 gallons, and to it is added a thin whitewash, made from the freshly slaked lime, stirring thoroughly and straining the whitewash if it contains large particles. When diluted to 45 gallons, the mixture is ready for use. Stock solution of copper sulphate may be made up in large quantity by using twice as many pounds of the sulphate as gallons of water, so that each gallon of the solution will contain 2 pounds of the salt. The solution must be protected from evaporation to prevent change of strength. A saturated solution in which the water contains all it will take up of the salt will hold 3 pounds (49 ounces at 59° F.) of sulphate per gallon of water. Two gallons of the stock solution, then, or 1⅓ gallons of the saturated will be sufficient for 45 gallons of water. The lime also may be slaked in quantity and the proper amount to be added be determined by a simple color test. When sufficient lime is not present drops of a solution of potassium ferrocyanide added to the Bordeaux mixture will immediately change to a dark, reddish brown, but if the lime is in excess no change will occur. Be sure the lime is in excess by adding it even after no color change takes place; for too much lime will do no harm but too little of it allows the sulphate to "burn" the foliage.

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*Abstracted from Bulletin 121, New York Agricultural Experiment Station.

Kerosene emulsion is made by dissolving one-half pound of common soap or whale oil soap in one gallon of water, heating to the boiling point and adding 2 gallons of kerosene. Pump the ingredients vigorously and repeatedly through a small force pump until they form a thick, creamy mass which does not separate on cooling. For use, heat cautiously, as it is very inflammable, and dilute with 10 to 15 parts of water for spraying foliage, or with 4 or 5 parts if for winter spraying of bare trunks and branches.

Paris green may be applied with Bordeaux mixture, 1 pound to 150 or 200 gallons on foliage of apples, pears, etc.; 1 pound to 250 or 300 gallons for stone fruits. When applied with water the same amount is used but 2 pounds of lime must be added for each pound of Paris green to prevent injuring the foliage. Adulteration of Paris green will be indicated if small white spots appear when the lumps are crushed between the fingers or between pieces of glass; or if the Paris green does not dissolve quickly in ammonia forming a solution of deep blue color and without sediment.

The appropriate spraying mixture should be applied very thoroughly to the affected plants, and this requires the assistance of a good pump and good nozzles. The exact style of pump to be used is a matter for the purchaser to decide as no one style can be said to be better than all others for all purposes. The good pump should work easily, maintain a steady spray from several nozzles, be simple in construction, have non-corrosive working parts, be durable and able to stand hard use, be easily taken to pieces for repair, have pipes properly arranged to prevent clogging, and be provided with an agitator which keeps the solution in vigorous motion and the sulphate and lime thoroughly distributed. Judging by cheapness alone often proves poor economy.

For a very finely divided spray that form should be chosen which is provided with a joint between nozzle chamber and elbow to allow easy access in case of clogging. A light bamboo pole, inclosing a brass tube and fitted with proper connections, seems the lightest and simplest means for raising the nozzles, and, with a light framework erected in the wagon or cart upon which the operator may stand, will usually afford sufficient elevation for even tall trees. The hand power pumps consist essentially of force pumps fastened upon or in barrels or other tanks which should be made round to avoid corners for collection of sediment. Bucket pumps of small size to be fastened to pails are made in great variety. They cost but little, can be obtained from most dealers, and are very useful where but a small amount of spraying is required.

Knapsack sprayers, because of the hard, dirty work involved in their use, are not to be recommended, unless the barrel and bucket pumps cannot be used to advantage.

Small machines for applying powdered materials are often very convenient for use in green houses and on small plantations. Two types are represented. One is made mostly of tin and consists of a reservoir and an enclosed hand-revolved fan which blows the powder out through a tube. The other distributes the powder by bellows action through a funnel-shaped spout.

The application of steam to spraying has of late received much attention but wholly satisfactory machines have not yet been developed. The outfit consists of a kerosene heated boiler, a pump and tank, and an agitator and one-horse-power engine to run it. This seems an expensive method of agitation and the attachment of the suction pipe to the bottom of the barrel is liable to cause clogging.

——State Food Commissioner of Ohio J. E. Blackburn has appointed Fred. W. Herbst, of Columbus, as State inspector of drugs.

WHY PHARMACISTS FAIL.

BY ALBERT H. BRUNDAGE, Ph.G., M. D., Vice President of the New York State Pharmaceutical Association.

A shrewd business man who recently had occasion to acquaint himself with the financial condition of pharmacists, marveled that so many were barely making a decent living and that there were so many absolute failures, that the department store, tablet triturate and similar general influences have undoubtedly had a depressing effect upon the drug business is very apparent; but those pharmacists who are accounted successful have also had these influences to combat, and many of the non-successful ones are but a little less so than they were before these adverse influences existed; some of those who have absolutely failed having always been on the point of failure. We are therefore forced to the conclusion that in very many instances the cause of failure lies in the pharmacist himself; that he is in many respects personally responsible for his non-success. And careful observation confirms this impression. Inasmuch as conducting a business with fairly profitable results is accounted success and such is the aim of every worthy pharmacist, it may be said that he who fails to secure such a result represents one degree of failure; and he who so utterly fails as to be forced to give up his business place represents the other degree. While a multitude of reasons may be advanced for individual failures, there are nevertheless reasons or causes which are common to so many unsuccessful pharmacists and are apparently in so many instances the direct causes of failure that they stand out conspicuously and pertinently as danger signals commanding the thoughtful attention of the members of the profession.

A very potent cause of failure is incompetency or unfitness. Some pharmacists have never fully and properly fitted themselves for their profession, consequently they are unable to successfully meet its rquirements and progressive demands. Some have entered the profession through chance association or through the false belief that it offers very great financial and social advantages. They have no real liking for the business and are consequently disinclined to acquire more than a superficial knowledge of it. Others, although they may like the business, are—like some men in some other lines of business—lacking in the energy or the mental capacity requisite to a successful mastery of it, and this business especially demands good mental capacity. It is more in keeping with the inclinations or ability of these men to be carried along by the business rather than to carry the business along. It is therefore but natural that success should usually be denied them. While an occasional pharmacist, among these, awakens to a consciousness of his deficiency and endeavors to remedy the evil by supplementary study and education, the majority who are thus situated are either ignorant of the fact or persistently ignore it.

Another cause of failure is neglect of business. Some pharmacists delegate to their clerks, duties and responsibilities which they themselves should discharge. Some are away from their stores more than the true interests of their business will permit. The pharmacist's patrons naturally like to deal with the proprietor himself or be assured by conspicuous indications that he is actually cognizant of what transpires in his store and is personally watchful of his patrons' best interests. They like to feel that in dealing with the clerk they have as good as dealt with the proprietor in person, through his supervision being so direct and constant as to guarantee the reliability of what is made and sold in his store. Aside from the effects upon him of such habits, for him to be known as a dissipated man, or even a frequent visitor at the race track, a great club man or bicycle fiend, or to similarly indicate that he is more or less weaned from his store and business and not fully, constantly and accurately cognizant of its affairs is to more or less seriously interfere with his business success.

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*Read before the Kings County Pharmaceutical Society, June 8. Contributed to the Era for publication.

Another potent factor in some pharmacists' failure is that they unwisely employ incompetent or careless and discourteous clerks, because they can hire such at a low salary and can manage to get along with them. Others have discarded them, but these men believe they are economizing by employing such, when really, they are guilty of reckless disregard of their business interests. Such employés are almost as unsafe as those who drink or steal. They are high at any price. Even an automaton would be better than these, for he would not be an active evil.

Some pharmacists by keeping too limited a variety of stock, by selling inferior stock, by the substituting crime or by neglecting to keep up their stock and habitually being "just out" of articles, drive their customers away. Patrons and physicians quite readily become acquainted with such facts and a dependence or confidence is lost which it is extremely difficult to restore. No wonder they fail.

A very important factor for success, which factor some pharmacists ignore to their own undoing, is the appearance of the store. No matter how elegant a stock may be in itself, if it be slovenly kept, neglected or poorly arranged, it loses all attractiveness and becomes on the contrary more or less disgusting and repulsive. A neat, judicious and ingenious display of goods, attracts, advertises and sells. Likewise, if articles sold are carelessly or slovenly put up, they detract from the good reputation so necessary to secure success. In these respects therefore he who would thus save labor actually squanders his living.

In connection with the matter of judicious display, it may be mentioned that the art of window dressing may be readily acquired and is one of the pharmacist's most ready and reliable methods of increasing his sales. He who is indifferent to its advantages is indifferent to his own best interests.

The personal appearance and business methods of some pharmacists invite disaster. Refined people usually dislike to be uniformally waited upon by a coatless or a collarless pharmacist or by one whose face is unshaven, hair unkempt, grimy hands, clothing spotted with the materials of his trade. The conclusion is that the same carelessness governs the person's pharmaceutical as well as his personal habits; therefore in the drug business, neatness is twin brother to accuracy in securing and retaining public confidence.

The pharmacist who permits within his store lounging with its attendant evils, or has himself acquired the habit of staring at his customers, criticising or gossiping about them one to another or is curt or discourteous either to his customer or clerks, is paving the way to failure. On the other hand, an attractive pharmacist, attractive in manners and methods with an attractive store will attract and retain business and thus insure success.

Some pharmacists are very injudicious in their buying and selling. They buy articles which they are unlikely to sell or buy in such large quantities drugs which it is necessary to have fresh, that these drugs become unsalable long before they are disposed of. Or they make the mistake in regard to drugs which keep well, or buying them in too small quantities to make their sale reasonably profitable; whereas, if not able to alone purchase in large quantities, by uniting with two or three of their fellows they could buy in such quantities as to secure a very advantageous discount. Indiscretion in purchasing is apt to force one to indiscreet prices in selling, thus the business suffers in both respects. My own experience as a pharmacist has taught me that we thoughtlessly acquire more or less indifferent business methods and that constant watchfulness and thoughtfulness are necessary to avoid the shoals on which so many encounter disaster.

Competency, courtesy, affability, neatness and altogether correct business methods inspire confidence and respect and open up the way to the highest success. He who adopts such measures is a pharmacist in the truest and best sense of the term and thus reflects credit upon his profession.

The moral of this whole matter may be largely summed up in the admonition of the old proverb: "Keep your shop and your shop will keep you."

PHARMACY.

THE AMERICAN ASSOCIATION FOR THE ADVANCEMENT OF SCIENCE holds its annual meeting this year at Detroit, August 9 to 14. The new high school building is to be used for the meetings of committees and sections. The association has invited the British association to meet in Detroit the week before its meeting in Toronto, an invitation which has been cordially seconded by the citizens of Detroit. Hon. Thos. W. Palmer is chairman of the general and finance committee. In all respects a splendidly successful meeting of the A. A. A. S. is assured.

ESSENCES OF SOAP.—White castile soap 100 p; alcohol (80 per cent.) 200; pure potassium carbonate, 12. The soap is dissolved in a wide-mouth bottle on the water bath by constant shaking with the alcohol, and the carbonate of potassium is then added. Then tint with saffron, or rosaniline, and perfume. Leave for some days in the cold, and filter. An excellent perfume for this is made by mixing tincture of vanilla, 10; tincture of orris, 20; extract of rose, 20; extract of orange flowers, 50. Rodiquet recommends for the preparation of the essence: White soap, 1; alcohol (85°), 3; distilled water, 1, and for medicinal purposes the following, which lathers strongly in water: White castile soap, 20; distilled water, 30; 60° alcohol, 60; potash, 1, and 1 per cent. of perfume. (Zeit. d. allgem. Oest. Ap.)

TESTING ALLOYS WITH RONTGEN RAYS.—The following new use for the X-rays was indicated in a recent lecture in England by Mr. Heycock, as reported in The Electrician, London, (Lit. Digest): "The lecturer," it says, "drew attention to the fact that the composition of metallic alloys is and always has been a vexed question; that is to say, it has always been very doubtful whether the metals which compose the alloys form a homogeneous mixture, or whether they exist as small distinct particles which are capable of being separated from one another. Now, some metals, such as sodium, permit of the passage through them of Röntgen rays while others, such as gold, prove to be quite opaque when submitted to the radiation from a Crookes tube. Having made an alloy of sodium and gold, containing a very small percentage of the latter metal, he allowed it to cool very slowly, just as the solution of potassium permanganate in water had cooled. When cold a very thin section was cut, which was then radiographed. The radiograph revealed the fact that the sodium had crystallized out from the general mass. This is one of the most interesting results which have been brought about by means of X-rays, and it opens up a wide field of research in microscopic photography which will probably enlighten us considerably with regard to the true nature of alloys. The atomic weight of sodium is 23 and that of gold is 197, so that sodium is roughly eight times more transparent to X-rays than gold. The atomic weight of carbon, on the other hand, is 12, and that of iron is 56, so that their transparencies are only as 5 to 1. However, the difference is sufficiently large to warrant the X-ray research into the true nature of the various brands of steel and iron."

ALKALINE IODIDES AND BROMIDES are prepared by Knobloch (Ph. Ztg., Ph. Jour.), by an ingenious method which obviates the simultaneous production of iodates and bromates, and the necessity for their subsequent reduction. The process depends on a series of reactions, in the first of which ferroso-ferric bromide or iodide is formed. This is decomposed by excess of milk of lime, which precipitates the iron as magnetic oxide.

The solution of calcium haloid salt is then treated with an equivalent quantity of an alkaline sulphate, when the insoluble calcium sulphate is precipitated, and the alkaline iodide or bromide goes into solution. The following details of the method for preparing potassium bromide is typical of all, substituting the equivalents of iodine or of sulphates of the other alkalies if it be desired to produce other salts: Iron filings, 8 parts, are introduced into a flask with 20 parts of water; bromine, 16 parts, is slowly run in, the mixture being kept cool meanwhile. When the action slackens it may be aided by a gentle heat if necessary until the green solution of ferrous bromide is obtained; this is decanted and 4 parts of bromine added, followed by a slight excess of milk of lime, which precipitates the whole of the iron as magnetic oxide, calcium bromide going into solution. Potassium sulphate, 21 parts, is then added, and the whole mixture heated on the steam bath for some hours. The hot solution is filtered, washed with a little hot water, the small amount of sulphate present in the filtrate precipitated with a slight excess of barium bromide, potassium carbonate added to faint alkalinity to precipitate traces of barium or calcium, and finally, after filtration, the liquid is neutralized with hydrobromic acid, concentrated by evaporation, and crystallized. The potassium bromide so obtained is pure.

YET THEY WANT TO BE REGISTERED PHARMACISTS.—Doctors in Missouri have tried hard to secure legislation which will admit them to registration as pharmacists without examination. How many would vote to grant this privilege to Doctor Stella, who writes the following letter, published without comment, and apparently in all seriousness in the Cleveland Journal of Medicine:

Taggerts Crossing, Haze Co., Mo., April 21, 1897.
To the Editor Cleveland Clinique.

Dear Doctor:—I have a patient which is giving me some trouble, and, as I have a great confidence in the Clinique's judgment, feel you can help me out. Irish parents aged 24 not heridetary, brunette tongue coated and accustomed to working out by the day. Last tuesday was Suddenly seized with vertigo of the head beginning in occiput near post office and fell on sidewalk paining her considerable. Found her in bed joint swelled and painful on precussion but no temperature though some inward fever and inclined towards prostration. Other functions normal. Prescribed six granules of your cicutine alternating every half hour with six of veratroidine, cranberry poultices to affected part and milk diet and diagnosed dramatic sprain of the main leaders of the left leg.

Now doctor as I know you have experience of cases of this kind and they are one of the best families please let me know in your next issue your opinion as to treatment & any changes if you think it advisable to.

Yours fraternally, STELLA G. S., M. D.

P. S.—Will send subscription soon as possible also state price of your Headache granules as I could not get along without your valued and beautiful journal.

(S. G. S., M. D.)

P. S.—Also price of your emmenagogine as I feel I ought to have some on hand.

WOOD ALCOHOL AND ACETATE OF LIME.—There is a good chance here for an improvement in a waste product which would net much money to the inventor, says Textile World. There are over sixty concerns in Pennsylvania alone, distilling pyroligneous acid, etc., from wood. The maple, poplar or hard wood is dried for a year or more and then subjected to a destructive distillation in steel retorts. Pine wood will not yield good results. The odors are objectionable, and practical operations, conducted a short time since, with a capital of $800,000, have not been able to make a commercial success of acetate of lime and wood alcohols from pine wood of Florida and Tennessee. One cord of hard wood is said, on authority, to yield 250 gallons of liquid. This liquid is re-distilled and twelve gallons of wood alcohol obtained; also commercial acetate of lime, usually 80 to 82 per cent. pure. The refuse per cord of wood is five gallons of wood-tar, and this is thrown into the creeks and streams, or anywhere to get rid of it. Laws are being passed by the different legislatures to prevent the contamination of the streams. This rejection of the wood-tar recalls the annoyance which coal-tar was at one time. They did not know what to do with the stuff, and one interesting case was that of the Philadelphia Gas Works, where a large quantity of the "waste product," coal-tar, was allowed to run into the Schuylkill. Subsequently, this became prized, and was all dug out by submarine mining operations. No one regards coal-tar now as a waste product, and wood-tar should be happily turned to account by some worthy successor of Perkin, Hofmann, and the host of honored names who have won their place in the niche of fame, by reason of their success in turning waste products into available articles.

IRON PYROPHOSPHATE AND PHOSPHORIC ACID. Wilbur F. Scoville, in a paper presented to the Massachusetts Pharmaceutical Association, discussed a number of prescription incompatibilities of interest to dispensers. Upon the well-known reaction between iron pyrophosphate and phosphoric acid he took the following prescription which is a somewhat common one:

Iron pyrophosphate	2 drams
Quinine sulphate	1 dram
Strychnine sulphate	2 grains
Dilute phosphoric acid	4 drams
Syrup	2 ounces
Water, to make	8 ounces

However compounded, a bulky precipitate is produced which fills the bottle about a third full, and a thin straw-colored supernatant liquid. Two efforts were made to secure a clear liquid: The iron salt was dissolved in five fluid ounces of water by the aid of a little heat, then 4 drams of citric acid were added (four times the amount of quinine prescribed), and dissolved, and finally the syrup was mixed with this solution. The alkaloids were dissolved in the phosphoric acid and the remainder of the water, and added to the iron solution, causing a voluminous precipitate. Ammonia was then added until a clear liquid was obtained—the acids not being entirely neutralized. This solution remained clear for nearly three days, then a crystalline precipitate appeared, which grew rapidly until equal in bulk to that in the original mixture.

An attempt was made to form an elixir similar to the familiar elixir of three phosphates. The iron salt was dissolved in the syrup and 1 ounce of warm water. Equivalents of the alkaloids were taken in place of their salts, viz., 80 grains of quinine and 1½ grains strychnine, and dissolved in a half fluid ounce of alcohol to which the phosphoric acid was added. This solution was diluted to five fluid ounces with aromatic elixir, and then mixed with the iron solution. A clear liquid resembling in appearance the N. F. elixir of three phosphates was produced. The liquid remained clear about four days, then small crystals formed at the bottom which required considerable shaking to diffuse. The ultimate deposit was comparatively small, but it is much coarser and less easily diffused than in the other methods of preparation.

APIOL.—W. Dulière, Jonas, and Francois state (J. Pharm. Chim., 1897, 5, 229; Jr. Soc. Chem. Ind.) that very dissimilar substances are sold under the name of apiol, varying in density, color, action of solvents and reagents, and action of heat, which decomposes adulterated apiol, the true apiol being volatile. Essential oil of parsley contains apiol and a terpine in varying proportions; according to Dulière, some essences contain no apiol. Jonas states that while the density of apiol, according to the Belgian Pharmacopœia, is 1.07 to 1.08, that of the French product is much lower. The property of apiol of sinking in water does not serve for the detection of impurities, a sample mixed with an equal volume of olive oil behaving, in this respect, exactly like pure apiol. Francois has studied the properties of apiol prepared in the following manner: 1 kilo of ground parsley fruit was twice macerated with 1 litre of 92 per cent. alcohol for 24 hours, the alcoholic solution shaken with 100 grms. of animal charcoal for 24 hours, and filtered; then one-quarter of the liquid was distilled off, the remainder being mixed with its own weight of chloroform and left to settle for 24 hours. After filtering, half of the liquid was distilled off. The residue was warmed at 100° to 110° C. until chloroform and alcohol were driven off, and to the cooled liquid one-eighth of its weight of litharge was added, the mixture digested for 24 hours, and filtered through a thick layer of animal charcoal. Thus obtained, apiol is a complex product, on fractional distillation 5 to 6 per cent. of a light yellow oil of strong odor and pungent taste passing over at 150°; this crystallized on cooling, and is the German "pure crystallized apiol." At 170°, a fatty oil of slight odor and bitter taste, and non-crystallizable, distils over. According to Francois, this is apiol. At about 190°, a brown colored mixture of resinous substances passed over. The apiol of commerce is generally colored green by chlorophyll, due to imperfect purification, or use of ether instead of chloroform. The principal adulterants are castor oil, linseed oil, glycerin, and gurjun balsam. The density is 1.08 at 15° C.; it is insoluble in water and benzene gives a cloudy solution in alcohol; is soluble in ether and chloroform, and very soluble in acetic acid. If apiol be allowed to run down the sides of a tube into nitric acid, at the point of contact a blood-red coloration is produced, turning to rose and then to yellow.

CHINESE VEGETABLE TALLOW.—G. de Negri and G. Sburlati (in Chem. Zeit., 1897, 21 (1), 5-6; Jr. Soc. Chem. Ind.), offer an interesting contribution on vegetable tallow, which is obtained from the fruit or seed of a variety of plants in many parts of the world; a more or less complete enumeration of which is given in the paper. By far the most important is the Chinese, from the so-called yaricou tree (Croton sebiferum, Linn.) The commercial article often contains an admixture of linseed oil. The seeds are husked and roughly broken, steamed till soft, beaten with wooden hammers, and the paste put into warm sieves, through which the melted tallow drops into pots. Or the seeds are bruised and boiled with water; the oil collects at the top and solidifies to a cake on cooling. The yield is from 20 to 30 per cent In some places 30 or 40 per cent. is got by hot pressing. Yet another method consists in steaming the seeds in a perforated inner vessel surrounded by an outer one. The "tallow" which envelops the seeds drops through the perforations into the outer vessel. From the remaining substance, by pressure, an oil called "tingyou" is got; this is used for lighting, and also in making varnishes. Samples of commercial vegetable tallow are white or greenish, and all are destitute of smell and taste. They appear usually as egg-shaped masses of from 55 to 60 kilos., which are covered with rice straw and wrapped in rush mats. Hannau, De Negri and Fabris, and more recently Hobein, have investigated the properties of vegetable tallow. Some of their figures are given in a table, with a summary of the results obtained by the present authors from ten samples. These ten samples left a faint greasy mark on paper, and showed a slightly acid reaction. They all dissolved freely in warm absolute alcohol, but almost completely separated out again on cooling. They were easily soluble in ether, benzene, chloroform, and carbon bisulphide. Their specific gravity at 15° was from 0.9182 to 0.9217, and 10 grms. yielded from 8.2 grams. to 8.7 grms. of fatty acids, which were white or yellowish. The difference between Hobein's figures and those of Negri and Fabris arises from the fact that the ether extracts not only the tallow but also some of the oil contained in the endosperm of the seeds. Hobein prepared some of this latter oil as a brownish-yellow fluid of sp. gr. 0.9498, saponification No. 203.8, iodine No. 145.6. The differences among commercial vegetable tallows arise partly from their being mixtures of tallows from different plants, partly from the different processes of extraction, and partly from changes which they undergo with the lapse of time.

A SIMPLE METHOD OF PREPARING GLYCEROPHOSPHATES.—The following method by Delage for preparing glycerophosphoric acid, and from it the various salts which have been much employed of late on the Continent, is, from its simplicity, well suited for use in the pharmacy: One part, by weight, of phosphoric acid, sp. gr. 1.454, is mixed in a flask with one and a half parts of glycerin, sp. gr. 1.242. The flask is fitted with a double-bored cork, fitted with a thermometer and an exit tube. It is then gradually heated in the ordinary way over a Bunsen; at 120° the liquid assumes a straw color, and as the temperature slowly rises it gradually darkens until 190° is reached, when the color is that of dark beer, and vapors of acrolein are given off. The heat is removed, and the vessel allowed to cool; a viscous mass resulting. One hundred grammes of phosphoric acid and 150 grammes of glycerin should require about forty minutes to complete the reaction.

To obtain glycerophosphate of lime, the resulting liquid is poured in small quantities at a time into a mixture of an excess of 50 grams of lime to 250 grams of water. The mixture is stirred, and, when effervescence ceases, allowed to stand for six hours, then filtered. To the faintly yellow clear filtrate one-half its volume of 90 per cent. alcohol is added, which throws down a flocculent precipitate of glycerophosphate of calcium. This is collected, washed with alcohol of the same strength, redissolved in water, and re-precipitated with alcohol and dried at as low a temperature as possible over a desiccator. In this manner a white powder is obtained, consisting of masses of microscopic crystals, soluble in about 20 parts of water, 100 grams of phosphoric acid yielding about 6 grams of this salt. From the mother liquors another salt, having the composition of an acid glycerophosphate, is obtained; this is not precipitated by alcohol.

The glycerophosphates of sodium and potassium can only be obtained in solution. Those of magnesium, strontium and lithium are really obtained from their carbonates in a similar manner to the lime salt. The iron salts are easily prepared, ferric glycerophosphate being obtained by the action of glycerophosphoric acid on moist ferric hydrate, and precipitating the solution with alcohol. The ferrous salt is prepared in a similar way, using the ferrous carbonate.

The author gives the following reactions for the pure salts: In aqueous solutions they are precipitated by heat; alcohol and ether precipitate them; they give no immediate precipitate with ammonium phosphomolybdate, nor with magnesium mixture, nor uranium acetate; the white silver nitrate precipitate is soluble in an excess of water; the white precipitate given by lead acetate is soluble in acetic acid. When treated with absolute alcohol no residue should be obtained on evaporating off the solvent.—Bull. Gén. de Thérap. (Section Pharmacol.), Pharm. Jr.

QUESTION BOX

The object of this department is to furnish our subscribers with reliable and tried formulas and to discuss questions relating to practical pharmacy, prescription work, dispensing difficulties, etc. Requests for information are not acknowledged by mail and ANONYMOUS COMMUNICATIONS RECEIVE NO ATTENTION.

Unanswered Queries.

Queries unanswered this week are from (H. T. E.,) Watertown, Wis.; (McK.), Macon, Ga.; (J. B.), Chicago, Ill.; (G. H. C.), Davis, Ind. Ty.; (J. A. D.), Toronto, Ont., and (H. M. G.), Chicago. To these correspondents we repeat the rules for the conduct of this department. Queries from subscribers or their clerks will receive our best attention, and, so far as possible, replies to them will appear in the order in which they are received. Queries from correspondents whose names do not appear upon our list of subscribers, and those ashamed to sign their names, will receive no attention. Clerks entitled to the use of these columns must let us know their employers' names or we can pay no attention to their requests for information.

Bottling Petroleum Jelly.

(H. G.) Gently heat the petroleum jelly until liquid and transfer to wide-mouthed bottles containing no moisture. There is no other "clean and economical" method.

Powder for Identification.

(J. E. J.) The principal constituent to which the powder you submit owes its therapeutic effect is sodium phosphate. Some sulphate is also present. We do not find it advisable to make a quantitative analysis.

Taka-Diastase.

(Subscriber.) Taka-Diastase, according to the literature issued by the manufacturers, Parke, Davis & Co., is a soluble vegetable ferment isolated by a Japanese chemist, Jakichi-Takamine, and, unlike pepsin, its action is not destroyed by drugs. Write to the manufacturers for literature upon the subject.

Soluble Pheoyle.

(W. F.) This preparation is a proprietary remedy which Hager says is patented in England, France and Austria, and is composed of a solution of phenol, soap, natrium, etc. It is said to be non-poisonous, and used in the treatment of scabies, mange, and various skin diseases which affect stock. We cannot give the formula.

Dose of Oil of Cedar.

(H. R. C.) Oil of cedar is rarely, if ever, given internally, and out of a large number of standard works on therapeutics and materia medica consulted, we fail to find the quantity constituting a dose stated. Several of the authorities state that it possesses properties similar to oil of turpentine and oil of juniper. Flückiger and Hanbury (Pharmacographia, London, 1879,) say that in the United States the oil of the red cedar (Juniperus virginiana, L.) is sometimes substituted for oil of savin.

Metal Syrup Cans in Soda Fountains.

(Subscriber.) We do not recall an instance where poisoning has resulted from the use of pure block tin for syrup cans in the soda fountain. This metal is nearly always employed in the construction of various parts of the apparatus, the coolers, pipes, etc., being wholly constructed of it. Strongly acidulous syrups, however, should always be kept in glass, porcelain or other containers not likely to be corroded. The use of metals such as copper, zinc, lead, etc., should be avoided. It has been claimed that symptoms of copper poisoning have resulted from drinking soda water drawn from copper fountains or tanks from which the tin lining has been corroded or destroyed.

Glue for Statement Pads.

(H. R. C.) Try the following:

Glue	4 pounds
Glycerin	2 pounds
Linseed oil	½ pound
Sugar	¼ pound
Aniline, q. s.	

The glue is softened by soaking it in a little cold water, then dissolved together with the sugar in the glycerin by aid of heat over a water bath. To the solution add the dye, and afterward the oil well stirred in. Use hot. Another composition of a somewhat similar nature is prepared as follows: Glue 1 pound, glycerin 4 ounces, glucose syrup about one ounce, tannin 48 grains. Give the compositions an hour or more in which to dry, or set before cutting or handling the pads.

Compound Syrup of Hypophosphites, N. F.

A. A., Baltimore, Md., furnishes the following note on the preparation of the above syrup: "The heavy precipitate which settles in the compound syrup of hypophosphites, N. F., has been a drawback to many of the druggists of the United States. I have made diligent researches and tests, and find the precipitate to be insoluble calcium phosphate. I have found that by adding 1 drop of dilute phosphoric acid to the dram and filtering or straining the preparation, a beautiful syrup of a golden hue is obtained."

We would remark that the formula for this preparation is not intended to produce a perfectly clear product, and the National Formulary recommends that it should be shaken before using.

Alabama Pharmacy Law.

(R. G.) Section 2 of the Alabama Pharmacy Law, approved Feb. 28, 1897, and now in force, makes it unlawful for the proprietor of any store or pharmacy in any village, town or city in the State of more than 900 inhabitants, or within two miles of any incorporated city of 900 inhabitants, to allow any person except a registered pharmacist to compound or dispense the prescriptions of physicians, or to retail or dispense poisons for medical use, except as an aid to and under the supervision of a registered pharmacist. Another section provides that any person, not a pharmacist or druggist, may open and conduct a pharmacy if he keep constantly in his employ a registered pharmacist, or druggist; but shall not himself sell or dispense drugs or medicines except proprietary and patent medicines in original packages.

Oil of Spike: Oil of Stone.

(J. D. S.) writes: A horse liniment composed of equal parts of oil of spike and oil of stone is frequently used here. I have always used crude petroleum in its preparation, a proceeding which is now called into question, and I want to know what I should dispense for "oil of stone."

Oil of stone is an old name for crude petroleum. True oil of spike is procured from the broad-leaved variety of lavender which grows wild in some parts of Europe. Its odor is less fragrant than that of common oil of lavender, and it resembles somewhat oil of turpentine, with which it is said to be often adulterated. A similar liniment to that named above and often dispensed is composed of equal parts of oil of turpentine and crude petroleum. A horse liniment often sold under the name of "oil of spike" is prepared from oil of turpentine, 1 gallon; Barbadoes tar, 4 ounces; alkanet root, 2 ounces; digest a week. The Era Formulary gives this one:

Oil of turpentine	32 ounces
Sulphuric acid	2 ounces
Barbadoes tar	16 ounces
Whale oil	64 ounces
Oil origanum	2 ounces
Oil juniper wood	1 ounce

Gradually add the sulphuric acid to the turpentine, stirring constantly; when cold, add the other ingredients.

California Pharmacy Law.

(H. Mc.) The California pharmacy law provides for two grades of licentiates; registered pharmacists, who must have four years' experience before registration, and assistant pharmacists, who are required to have two years' experience and to be 18 years of age. Provision is also made for registration without examination of graduates of legally constituted colleges of pharmacy who have had four years' experience. In the opinion of Prof. J. H. Beal the wording of the law would seem to permit the registration without examination of persons who have had four years' experience and "shall present satisfactory credentials or certificates of their attainments" to the board. The law distinguishes between "graduates in pharmacy" and "licentiates in pharmacy," using the latter term as a designation for one who is registered by examination. The fee for registration is $5 for pharmacists and $2 for assistants. An annual renewal fee of $2 is required from pharmacists and $1 from assistants. Pharmacists are required to file the original of every prescription they fill and preserve the same for two years. When ordered by the prescribing physician, a copy of the prescription must be supplied. Persons registered under the Pharmacy Act are exempt from jury duty. The secretary of the board is John Calvert, 400 Sutter street, San Francisco.

Deodorizing Wood Alcohol.

(R. P. C.) We know of no process for satisfactorily purifying and deodorizing wood alcohol without employing distillation. Some years ago Huber proposed taking methylic alcohol having a specific gravity of 0.826 and boiling at 68° C., and treating it with pure oxalic acid until saturated. The mixture, as worked in his process, was then heated for a while. On cooling methyl oxalate would crystallize out, but he transferred the mixture to a still, added some potassium carbonate, and then some small lumps of dry quicklime, quickly connecting with the condenser. The hydration of the lime starts the reaction, the methyl oxalate is decomposed, while the heat generated serves to vaporize the methylic alcohol, which is condensed in the receiver. The process was further improved by adding more potassium carbonate and a few grains of potassium permanganate, and distilling once more. The distillate deprived of its rank odor had a specific gravity of 0.889, and boiling point of 66° C. This method is similar to that suggested years ago by Wöhler (Roscoe).

Instead of using oxalic acid, benzoic acid has been suggested by Carius. His method consists in producing methyl benzoate by saturating a solution of benzoic acid in methyl alcohol with hydrochloric acid, and then removing the more volatile product by distillation. The residue is washed with water, and then decomposed by heating with caustic soda.

Cigar Flavoring.

(S. Bros.) Here are a number of formulas compiled from various sources:

(1) Macerate 2 ounces of cinnamon and 4 ounces of tonka beans, ground fine, in 1 quart of rum.

(2) Moisten ordinary cigars with a strong tincture of cascarilla, to which a little gum benzoin and storax may be added. Some persons add a small quantity of camphor, or oil of cloves or cassia.

(3) Tincture of valerian	4 drams
Butyric aldehyde	4 drams
Tincture vanilla	2 drams
Nitrous ether	1 dram
Alcohol	5 ounces
Water, enough to make	16 ounces

(4) The following formula was contributed to an exchange some years ago as one which was put up for cigar manufacturers:

Extract vanilla	4 ounces
Alcohol, Jamaica rum, of each	½ gallon
Tincture valerian	8 ounces
Caraway seed	2 ounces
English valerian root	2 ounces
Bitter orange peel	2 ounces
Tonka beans	4 drams
Myrrh	16 ounces

Soak the myrrh for three days in 6 quarts of water (?), add the alcohol, tincture valerian and extract of vanilla, and after grinding the other ingredients to a coarse powder, put all together in a jug and macerate for two weeks, occasionally shaking; lastly, strain.

See also Era, April 15, 1892, page 238.

Trapa Bicornis.

(Subscriber.) The so-called "Chinese lily," a sketch of which you submit, is not a lily. It is the Trapa bicornis belonging to a genus of aquatic plants natives of Europe, India, China and Japan. The Trapas belong to the natural order Onagraceæ an order according to Bessey consisting of about 300 species, represented in the United States by species of Epilobinum, Oenthera and other genera. Trapa natans is a species indigenous to Central and Southern Europe and yields the "Jesuits' Nut" of Venice. Trapa bicornis is the Chinese species, and is said to afford the "ling" of that country, which is largely used as an article of diet. These plants are remarkable for the shape of their seeds, some of which resemble a bullock's head and horns. The plant is called by various authors trapa, water caltraps, water chestnut, etc. The nut grows under the water after the flowers decay, is often of triangular shape, and covered with a tough brown integument adhering strongly to the kernel, which is white, esculent and of a fine cartilaginous texture. Various descriptions of its cultivation in the East are to be found in the writings of travelers who have visited that region. Loudon's Encyclopedia of Plants (London, 1866), in tracing the derivation of the word "trapa," says it is abridged from "calcitrapa," the Latin name for a dangerous instrument called "caltrops," which was furnished with four spines and formerly used in war to impede the progress of cavalry. Perhaps the most interesting point about the trapas to the pharmacist is the capabilities of the plants for manganese. The late Prof. Flückiger made some investigations upon this subject which are recorded in the Pharm. Journal, 3d series, XVI., page 621.

Crystals: Granules.

(O. E. H.) asks if there is any difference between crystals and "granules."

We think if our correspondent were to consult his text books he would not need to ask this question, nor would he use the term granule where he evidently refers to granulation. However, some knowledge of crystallography is necessary to accurately understand the scientific definition of a "crystal." When a chemical substance passes from the gaseous or the liquid state into that of a solid, it generally assumes a definite geometrical form, and it is said to "crystallize." A crystal then, is a solid body, bounded by plane surfaces arranged symmetrically according to definite laws. As a rule, every chemical substance in the solid state possesses a distinct form in which it crystallizes, and by which it can be distinguished. For this reason a knowledge of crystallography is most important to the pharmacist.

Granulation is disturbed crystallization. In other words, it is the process of rapidly stirring a solution of a crystalline salt during evaporation until all the liquid is expelled. The residue is a granular or coarse grained powder of broken crystals. In practical pharmacy granulation is employed to obtain many salts in a more convenient form for dispensing, and, also, as a method of purification.

"Granules" is a term employed to designate very small coated pills. This application is of French origin, though "granule" comes from the Latin "granulum" (diminutive of "granum," a grain), meaning a small grain or compact particle. The principles of crystallography and their application to practical pharmacy will be thoroughly discussed and explained in the Era Course in Pharmacy announced to appear in this journal. You should look out for it.

Hair Dye.

(A. H. T.) There is no hair dye which produces a durable coloration; the color becomes gradually weaker in the course of time and the new growth of hair always requires after coloration. Here are some typical formulas in which a mordant is employed:

(1)	Nitrate of silver	½ ounce
	Distilled water	3 ounces
	Mordant:	
	Sulphuret of potassium	½ ounce
	Distilled water	3 ounces
(2)		
(a)	Nitrate of silver (crystal)	1½ ounces
	Distilled water	12 ounces
	Ammonia water, sufficient to make a clear solution.	

Dissolve the nitrate of silver in the water and add the ammonia water until the precipitate is re-dissolved.

(b)	Pyrogallic acid	2 drams
	Gallic acid	2 drams
	Cologne water	2 ounces
	Distilled water	4 ounces
(3)	Nitrate of silver	20 grains
	Sulphate of copper	2 grains
	Ammonia, q. s.	

Dissolve the salts in ½ ounce of water and add ammonia until the precipitate which is formed is re-dissolved. Then make up to 1 ounce with water. Apply to the hair with a brush. This solution slowly gives a brown shade. For darker shades, apply a second solution, composed of

Yellow sulphide ammonium	2 drams
Solution of ammonia	1 dram
Distilled water	1 ounce

Black Hair Dye Without Silver.

Pyrogallic acid 3.5 grams, citric acid 0.3 gram, boroglycerin 11 grams, water 100 cc. If the dye does not impart the desired intensity of color the amount of pyrogallic acid may be increased. The wash is applied evenings, following in the morning by a weak ammoniacal wash.

One Bottle Preparation.

Nitrate of copper	360 grains
Nitrate of silver	7 ounces
Distilled water	60 ounces
Water of ammonia, a sufficiency.	

Dissolve the salts in the water and add the water of ammonia carefully until the precipitate is all re-dissolved. This solution, properly applied, is said to produce a very black color; a lighter shade is secured by diluting the solution. Copper sulphate may be used instead of the nitrate.

Frank L. Way, West Manchester, N. H.—The philanthropic announcement should evince an awakening interest among the pharmacists and their clerks, in the commendable efforts of the Era, and cannot fail to become an attractive feature to that already popular publication. While having had twenty years' experience in the drug business, my field of labor does not warrant me feeling competent in offering suggestions to your plans, as I know that others are ready to serve you efficiently. I wish the Era every success.

THANKS.

Bridgeport, Tex., May 31, 1897.

The Pharmaceutical Era, New York.

Gentlemen: Unsolicited I wish to say in behalf of the Era that I consider your new departure, the Weekly Era, a boon to druggists, being just what is needed to keep them in touch with the drug market and abreast with the times. It is a result of modern and judicious and brainy progression. May its continued success never abate. Yours truly,

H. F. LACKEY.
of Emery Bros. & Lackey.

ERA COURSE IN PHARMACY.

THE FACULTY.

The following well-known teachers have accepted positions on the faculty, and the list will be greatly increased before the opening of the term:

Prof. Virgil Coblentz, New York.
Prof. L. E. Sayre, Lawrence, Kan.
Prof. Oscar Oldberg, Chicago, Ill.
Prof. William Simon, Baltimore, Md.
Dr. George B. Kauffman, Columbus, Ohio.
Prof. J. U. Lloyd, Cincinnati, Ohio.
Dr. Edward Kremers, Madison, Wis.
Dr. George F. Payne, Atlanta, Ga.
Prof. Arthur L. Green Lafayette, Ind.
Prof. J. W. Sturmer, Lafayette, Ind.
Prof. Wilbur L. Scoville, Boston, Mass.
Prof. F. J. Wulling, Minneapolis, Minn.
Prof. E. A. Ruddiman, Nashville, Tenn.
Prof. Charles F. Heebner, Toronto, Ont.
Prof. T. D. Reed, Montreal, Que.
Dr. Albert E. Ebert, Chicago.

The amount of printed space to be accorded to lectures in this course can be only approximately estimated It is assumed, however, that each lecture will average about 2½ pages of the Era. Some idea may be obtained of the subjects and the number of lectures accorded to each from the following outline of lectures prepared for the first half (section A) of the junior course: Introductory, 1 lecture; pharmaceutical physics, 10; notation, nomenclature and equations, 3; general chemistry, 4; chemistry of the non-metals, 6; descriptive and systematic botany, 8; special topics, 5 lectures.

Pharmaceutical Microscopy will be taken up in the latter half of the junior year. The following are divisions of the subject and some of the topics to be discussed: The laws of optics in relation to microscopy; the simple microscope and its use; structure, theory and manipulation of the compound microscope; preparation and examination of specimens; sectioning, staining and mounting of hard and soft tissues; manufacture of permanent mounts, etc.

Pharmaceutical Latin is not to be neglected in the curriculum of the Era Course in Pharmacy, and it will be considered during the first twenty weeks of the senior year. This course will present a brief outline of the Latin of pharmacy and medicine, including a consideration of the declensions, conjugations, rules of agreement, and also the Latin of prescription writing, abbreviations, pharmacopœial nomenclature, etc.

INQUIRIES ANSWERED.

Blairstown, Mo., June 2, 1897.

The Pharmaceutical Era, New York.

Dear Sirs: As our firm (L. A. Wisely & Son) are subscribers to the Era, and paid to Dec. 31, 1897, and I wish to take the course in Pharmacy, is it necessary for me to also become a subscriber? Please advise me in regard to text books needed so that I may get the best ones suited for the lectures. * * * Very truly yours,

GEORGE D. WISELY.

It is not necessary for you to subscribe, but have your firm give us a written order to transfer their subscription to your name, also send us $1.50 to carry the subscription up to June 30, 1898.

Our editorial department will write you in regard to the text books required in addition to those you now have. These text books can be secured through any book dealer or through your wholesale druggist.

A. C. Wallace, Bellefontaine, Ohio.—I wish to commend and recommend your Era Course in Pharmacy. It will be of greatest value to those who are engaged already in the business in the smaller cities and country towns, a large proportion of whom cannot, through lack of time or means, attend a college. Some years ago the writer took a similar course in another institute, and was not only much interested, but so instructed and benefited as to enable him to successfully pass a rigid examination before the Ohio Board of Pharmacy.

The Era Course in Pharmacy.

PUBLISHED BY
The Pharmaceutical Era,
106 Fulton Street, New York.

J. H. BEAL, Sc. D., Ph. G.,
Director of the Course of Instruction,

CHARLES W. PARSONS, Ph. C.,
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There never was a time when it required so much study and educational preparation to become and remain a first-class pharmacist as at present. Never before was so much demanded from the dispensing druggist, and never has the struggle for existence and subsistence been as keen and fierce as it is to-day.

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This course of study, to accomplish its object, must be carefully graded, it must be systematically pursued, it must be properly directed, and, in order to reach the class who will be most benefited by it, must be comparatively inexpensive. This is the character of the instruction which The Era Course in Pharmacy aims to supply.

ANNOUNCEMENT.

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The following is a condensed statement of the method to be pursued in presenting the lectures and carrying on the quiz and examination features of the work:

Each year is divided into two sections of about twenty weeks' duration each, and designated respectively as Sections A and B. The complete course will thus consist of eighty weeks of lectures, exclusive of vacations. In addition to the regular lectures of the sections a number of lectures in the form of papers upon special pharmaceutical topics will be given by practical druggists. These are to be considered as extras, thrown in without additional cost to the subscriber.

WRITTEN EXAMINATIONS.

At the close of each twenty weeks' series of lectures a written examination will be held upon all the lectures of that series. In like manner, the work of the junior year will close with an examination upon the junior studies.

At the end of the senior year a final general examination will be held to determine the student's fitness to receive the diploma of the course.

The prizes subsequently mentioned in this prospectus will be awarded upon the grades made upon the written recitations and examinations.

**The Course Year begins with the first issue of July, 1897, and ends with the last issue of June, 1898. The issues of July and August will be devoted to preliminary announcements, answering of questions, and preparing the students for the regular course of lectures which will start in September. It is important that all persons desiring to join this Course file their applications before July 1, and thus receive the benefit of the preliminary work during July and August.*

SCHEDULE OF SUBJECTS.

It should be understood that the following schedule of subjects and syllabi of lectures are provisional merely, and subject to such changes as may be found necessary as the work proceeds. The student may, however, rest assured that only such alterations will be made as will add to the efficiency and completeness of the course.

JUNIOR YEAR.

SECTION A. 20 WEEKS.

Introductory.
Pharmaceutical Physics.
Chemical Notation and Nomenclature.
Inorganic Chemistry, Non-Metals.
Descriptive and Systematic Botany.
Special Topics.

SECTION B. 20 WEEKS.

General Pharmaceutical Processes.
Inorganic Chemistry, Metals.
Principles of Pharmacognosy.
Qualitative Chemical Analysis.
Special Topics.

SENIOR YEAR.

SECTION A. 20 WEEKS.

General Organic Chemistry.
Pharmaceutical Arithmetic.
Materia Medica, Beginning.
Special Topics.

SECTION B. 20 WEEKS.

Inorganic Chemicals of the Pharmacopœia.
Organic Chemicals of the Pharmacopœia.
Materia Medica, Continued.
Prescriptions and Dispensing.
Special Topics.

PRACTICAL STUDIES.

As far as possible the studies of the course will be directed into practical channels. Wherever the nature of the subjects will admit, the lectures will be accompanied with directions for the performance of experiments, either illustrative of the subject studied, or for the development of the student's powers of observation. These experiments will usually be of such a nature that the resources of the average drug store will be sufficient for their demonstration, thus affording the student some of the advantages of practical laboratory courses.

In the case of such subjects as Botany, Pharmacognosy and Materia Medica the student will be instructed how to obtain and properly use the materials for their illustration.

TOPICS COVERED BY THE OUTLINE OF LECTURES.

Only a partial outline of the regular lectures of the course can be given here, barely sufficient to enable the student to judge of the general character of the lectures and of the ground traversed. The topics of the numerous special lectures and papers are not included in this list, but will be announced from time to time in the pages of the Era.

General Inorganic Chemistry.

General Principles: The Properties of Matter, Elements, Compounds, Mixtures, Chemical Affinity, Atoms, Molecules, Chemical Notation and Nomenclature, Equation Writing, Laws of Definite and Multiple Proportions, Varieties of Chemical Activity, Nascent State of Elements, Analysis and Synthesis, Acids, Bases, Salts, Classification of the Elements, the Periodic Law, Allotropism.

Chemistry of the Non-Metals.

The History, Natural Occurrence, Mode of Preparation, Physical and Chemical Properties, Principal Compounds, Methods of Identification and Pharmaceutical Uses of the Principal Non-Metals in the following order:

1. The Halogen Group.
2. The Oxygen and Sulfur Group.
3. The Carbon Group.
4. The Nitrogen Group.

Chemistry of the Metals.

History, Natural Occurrence, Mode of Preparation in the free state, Physical and Chemical Properties, Principal Compounds, Methods of Identification, and Pharmaceutical Uses of the principal metals in substantially the following order:

1. The Alkali Metals.
2. The Alkaline Earth Metals, 1st division.
3. The Alkaline Earth Metals, 2d division.
4. Aluminium, Boron and the Rare Earths.
5. Iron, Cobalt, Nickel, Manganese.
6. Chromium Group of Metals.
7. Copper, Silver, Gold.
8. The Platinum Metals.

With each group will be given directions for easily performed illustrative experiments.

Pharmaceutical Physics.

The General Principles of Physics as applied to pharmaceutical and chemical processes. Weights and Measures, Specific Gravity, General Principles of Heat, Thermometry, Generation and Application of Heat, Solution, Solvents, Capillarity, Osmose, Dialysis, etc., etc.

General Pharmaceutical Processes.

A general descriptive outline of the principal physical processes made use of in pharmaceutical manipulation, as Evaporation, Desiccation, Distillation, Sublimation, Solution, Filtration, Crystallization, Granulation, Precipitation, General Principles of Drug Extraction, Comminution, Maceration, Digestion, Percolation, Expression, etc.

Descriptive and Systematic Botany.

Organography and Gross Anatomy of Flowering Plants. Structure, Arrangement and Uses of the Organs of Vegetation and Reproduction, Plant Physiology and Chemistry, General Principles of Plant Classification, Principal Natural Groups of Plants, Methods of Identifying Common Flowering Plants, etc.

Pharmacognosy.

General Principles of Morphology, Organography and Histology in their relations to Pharmacognosy. The Cell and Its Morphology, Cell Formation, the Products of Cell Life, Description of the Vegetable Tissues and Tissue Systems, Classification of Drugs according to their Physical Characters, with directions for preparing and using drug specimens for study.

Organic Materia Medica.

The more important vegetable drugs receive individual attention, according to a convenient system of classification. Under each drug are considered Botanical Origin, Habitat, Histological Characters, Constituents, Physiological Properties, Uses in Pharmacy and Medicine, Official Preparations and Dose. Simple directions are given for the preparation and examination of specimens.

Qualitative Chemical Analysis.

1. The General Principles of Inorganic Qualitative Analysis.
2. Preliminary Examination of Unknown Materials.
3. Grouping of the Bases.
4. Separation of Bases in Simple Mixtures.
5. Detection of the Common Acids.

Each lecture to be accompanied by simple directions for practical studies.

General Organic Chemistry.

The General Principles of Organic Chemistry, including a consideration of Empirical, Rational, Constitutional and Structural Formulæ, General Nature and Classification of Organic Compounds, the Hydrocarbons, Alcohols, Aldehydes, Mono- Di- and Tribasic Acids, Ethers, Carbohydrates, Amins and Amids, Cyanogen Compounds, Benzene Series, Benzene Derivatives containing Nitrogen, Alkaloids, Proteids, etc., with directions for simple experiments.

Chemical and Pharmaceutical Arithmetic.

The Calculations of Molecular Weights, Percentage Composition from Molecular Formulæ, Calculation of Constituent in Fixed Amount of Compound, or of Compound to yield Fixed Amount of Constituent. Calculations Based on Equations, Calculations of Gaseous Weights and Volumes, and of Alterations in volume from variations in Temperature and Pressure. Weight, Volume and Specific Gravity of liquids and solids, their Relations and Calculations. Percentage Solutions and Mixtures, Alligation of Values, two or more constituents, etc., with numerous practical examples.

Inorganic Chemicals of the Pharmacopœia.

Under this title the inorganic chemical substances are taken up according to a convenient method of classification, and receive consideration in the light of their pharmaceutical applications. The points which are given prominence are: Methods of Manufacture and Purification, Tests for Identity and Impurities, Chemical and Physical Properties, Pharmaceutical and Medicinal Uses, etc. As in the preceding and following chemical studies, directions are given for the performance of numerous experiments in illustration of the subject.

Organic Chemicals of the Pharmacopœia.

Under this subject the organic chemical substances of the Pharmacopœia receive treatment in the manner described under the preceding title.

Prescriptions and Dispensing.

General Principles: The Nature, Construction and Component Parts of the Prescription. Origin of the Signs and Abbreviations used in prescribing. Grammatical Form, Interpretation and Treatment of the Prescription. Principles of Extemporaneous Pharmacy, Incompatibilities, Dispensing Difficulties and their Remedies. Methods of Numbering, Dating and Filing Prescriptions. Miscellaneous Dispensing.

Galenical Preparations of the Pharmacopœia.

Classification of Official Galenicals, and their Division into Groups and sub-Groups. Liquid Galenicals: Waters, Solutions, Syrups, Honeys, Mucilages, Mixtures, Infusions, Decoctions, Emulsions, Glycerites, Collodions, Liniments, Oleates, Elixirs, Spirits, Wines, Tinctures, Fluid Extracts, Vinegars, etc. Solid Galenicals: Extracts (Abstracts), Resins, Powders, Triturations, Troches, Confections, Masses, Pills, Suppositories, Cerates, Ointments, Plasters, Papers, etc.

OPENING OF THE SESSIONS.

NUMBER OF LECTURES, VACATIONS, ETC.

The regular lectures of Section A will begin with the first issue of the Pharmaceutical Era in September, and with the exception of two weeks' intermission at the Christmas holidays, will continue twenty weeks. The lectures of Section B will open with the first issue in March and will continue twenty weeks. Each issue of the journal will probably contain two lectures of the course, though the total number of lectures in each section will probably much exceed forty, owing to the numerous lectures and papers upon special topics, which it is purposed to furnish. The written recitations and examinations will, however, only be upon the lectures of the course proper.

According to the arrangement outlined above there will be two vacations in the year, one of two weeks in the winter, and a longer one in the summer.

EXPENSES.

1. All the regular lectures of the Course, also the additional lectures or papers on special topics, will be printed weekly in The Pharmaceutical Era, and will be free to all subscribers to this journal. The total number of lectures will be from 40 to 60 during each term of 20 weeks, and each student is required to become a subscriber to the journal in his own name.

2. The only additional charge to subscribers who wish to join the regular classes is a Registration Fee of $2 per term (10 cents a week). This amount is to cover the expense of the written recitations and examinations by direct mail with each student; for expenses of recording the grades of recitation and examination blanks, and incidental expenses of stationery, postage, etc.

3. An Era binder will be found of great convenience for preserving the copies of the journal as they are received, and these cost 75 cents each post paid.

4. The entire expense is as follows: Subscription to The Pharmaceutical Era for one year, $3.00; one Era binder, 75 cents; registration fees for the two terms, $4.00, making a total expense of only $7.75 per annum for each student.

TEXT BOOKS.

As a means of adding greatly to the benefit to be derived from his study of the lectures the student is advised to provide himself with at least one good text-book upon each of the principal subjects of the course. As a convenience to the student, a list of reliable works suitable for student's use is appended. Any one of the recommended texts will answer.

Any such books can be obtained from any general book store, or through the wholesale druggists.

GENERAL PHARMACY.

Caspari, Treatise on Pharmacy. $4.50. Lea Bros. & Co., Philadelphia.

Coblentz, Handbook of Pharmacy. $3.50. P. Blakiston, Son & Co., Philadelphia.

Oldberg, Home Study in Pharmacy. $3.00. The W. T. Keener Co., Chicago.

Remington, Practice of Pharmacy. $6.00. J. B. Lippincott Company, Philadelphia.

U. S. Pharmacopœia. $2.77. P. Blakiston, Son & Co., Philadelphia.

GENERAL PHARMACEUTICAL CHEMISTRY.

Bartley, Medical Chemistry. $2.75. P. Blakiston, Son & Co., Philadelphia.

Simon, Manual of Chemistry. $3.25. Lea Bros. & Co., Philadelphia.

Wulling, Pharmaceutical Chemistry. $2.00. John Wiley & Sons, New York.

Remsen, Organic Chemistry. $1.30.

BOTANY.

Bastin, College Botany. $2.50. G. P. Engelhard & Co., Chicago.

Culbreth, Pharmaceutical Botany. $2.00. Author, Baltimore.

Willis, Practical Flora. $1.50. American Book Company, New York.

Wood, Botanist and Florist. $1.75. American Book Company, New York.

PHARMACOGNOSY.

Rusby and Jelliffe, Essentials of Pharmacognosy. $2.50. D. O. Haynes & Co., New York.

Wall, Notes on Pharmacognosy. $1.50. Meyer Bros. Drug Company, St. Louis.

MATERIA MEDICA.

National Dispensatory. Full sheep $8.00. Lea Bros., Philadelphia.

U. S. Dispensatory. Full sheep, $8.00. J. B. Lippincott Co., Philadelphia.

Sayre, Organic Materia Medica. $4.00. P. Blakiston, Son & Co., Philadelphia.

PRESCRIPTIONS AND DISPENSING.

Scoville, The Art of Compounding. $2.50. P. Blakiston, Son & Co., Philadelphia.

Wall, The Prescription. $1.50. Aug. Gast Bank Note and Lithograph Company, St. Louis.

ANALYSIS.

Prescott and Johnson, Qualitative Analysis. $3.50. D. Van Nostrand Company, New York.

Sehimpf, Volumetric Analysis. $2.50. John Wiley & Sons, New York.

CHEMICAL NOTATION AND PHARMACEUTICAL ARITHMETIC.

Beal, Notes on Equation Writing and Chemical Arithmetic. 75 cents. Nitschke Bros., Columbus.

HOW TO PURSUE THE ERA COURSE IN PHARMACY.

The benefit derived from any course of study depends largely upon the system and regularity with which it is pursued. All study is beneficial, even when haphazard or irregular, but never so much so as when intelligently directed and regularly followed up. The prime object of The Era Course in Pharmacy is to afford the opportunity of such regular and systematic study under the direction of teachers of large experience and familiar with the needs of students.

The student will undoubtedly derive great benefit simply from the careful perusal of the weekly lectures of the course, but this benefit will be a minimum as compared with that which he may receive from conscientiously following out the program of exercises as arranged. The most important part of this programme is the regular weekly study of the lectures as they appear, and the giving of faithful attention to the written quizzes and examinations. No student can so thoroughly acquaint himself with the contents of the lectures that he cannot gain something more by the attempt to place his knowledge upon paper in the form of a written recitation. The recitation is not only the proof of the student's having carefully studied the lectures, but it is the most effective means of developing that knowledge, and of permanently fixing it in his memory.

How to Study.

First of all, have regular hours of study. A few minutes bestowed regularly each day will be of greater benefit than hours of irregular and desultory reading. To thoroughly master the subject matter of a lecture will require about three perusals; first, an easy reading to discover the general scope and arrangement of the subjects treated of, then a very careful study to discover thoroughly the teaching of each paragraph, and, finally, another general review to classify the whole and bring out the connections and relations of its various parts.

After the substance of the lecture has been mastered, the student may profitably bestow any remaining time upon the reference texts which accompany the lectures. It is well, however, to defer this reference until after the lecture has received its full consideration. The objection to the reading up of references before the lecture has been mastered lies in the temptation to desultory and careless reading, to the neglect of general principles.

As each recitation blank is received the questions should first be gone over carefully so as to discover their full meaning, and the answers then written, if possible, from memory. If in doubt as to an answer, the student should recur to the lecture and again go over the difficult portion very carefully.

Make all answers brief and to the point, but do not omit important particulars. Do not presume upon the knowledge of the quiz master and leave it to him to guess at your meaning. Answer all questions as if you were explaining the matter to some person entirely unacquainted with the subject.

Write neatly and plainly, and be careful to spell all words correctly.

Try not only to study *about* things, but as much as possible study *things* themselves. When an experiment is given, or a reaction described, make an attempt to perform the experiment and to obtain the reaction.

When a drug is under consideration, no matter how often you have handled that particular substance before, obtain a sample and observe it in connection with the lesson. Note its general appearance carefully, distinguish all the different parts visible to the eye or by means of a simple magnifier, smell it, taste it, examine its preparations and note their properties and doses.

It will be profitable to have at hand a good dictionary, and to consult it whenever a new or unfamiliar term occurs.

If after a careful search for the answer to a question it is not found, ask some one who knows, but always first make an earnest effort to discover the answer for yourself.

To the untrained student some of these directions may seem trifling or unnecessary, but it will be among those who most clearly appreciate their significance and conscientiously follow them out that the prize winners will be found at the end of the course.

PRIZES.

As a stimulation to students to put forth their best endeavors, and to take the highest rank possible in their studies, a number of prizes will be awarded at the close of each section of twenty weeks. This list of prizes will be so liberal in number that any student who faithfully follows the course in the manner herein advised may reasonably hope to be found among the prize takers. The names of such successful students will be published in the Pharmaceutical Era.

What these prizes are to be will be definitely announced at a subsequent date before the opening of the course.

APPLICATION FOR MATRICULATION.

OFFICE RECORDS.
NO. ______
PAGE ______

THE PHARMACEUTICAL ERA,
106 Fulton St., NEW YORK.

______________1897

Dear Sirs:—Please enroll me as a matriculant for one year in

THE ERA COURSE IN PHARMACY FOR 1897-8.

I am ____________ years of age and have had ____________ years experience in a drug stor

I am ____________ with the drug firm of ____________
(PROPRIETOR OR CLERK.)

I have been registered as ____________ in the State of ____________
(PHARMACIST OR ASSISTANT.)

Enclosed find ____________ for $7.75* to pay for matriculation and 1 year's subscription
(N. Y. DRAFT, P. O. OR EXPRESS MONEY ORDER.)

The Pharmaceutical Era (July 1, 1897 to June 30, 1898) also 1 Era Binder.

Full Name ____________

Address ____________

---

*Each member of this course must be a subscriber in his own name and paid to June 30, 1898. If already a subscriber you need only remit sufficient amount (25 cents a month) to carry your subscription to June 30, 1898. If you have or don't want an Era Binder deduct 75 cents.

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The time required for the completion of the course as outlined in this prospectus is two years, known respectively as Junior and Senior.

The following is a condensed statement of the method to be pursued in presenting the lectures and carrying on the quiz and examination features of the work:

Each year is divided into two sections of about twenty weeks' duration each, and designated respectively as Sections A and B. The complete course will thus consist of eighty weeks of lectures, exclusive of vacations. In addition to the regular lectures of the sections a number of lectures in the form of papers upon special pharmaceutical topics will be given by practical druggists. These are to be considered as extras, thrown in without additional cost to the subscriber.

WRITTEN EXAMINATIONS.

At the close of each twenty weeks' series of lectures a written examination will be held upon all the lectures of that series. In like manner, the work of the junior year will close with an examination upon the junior studies.

At the end of the senior year a final general examination will be held to determine the student's fitness to receive the diploma of the course.

The prizes subsequently mentioned in this prospectus will be awarded upon the grades made upon the written recitations and examinations.

**The Course Year begins with the first issue of July*, 1897, *and ends with the last issue of June*, 1898. *The issues of July and August will be devoted to preliminary announcements, answering of questions, and preparing the students for the regular course of lectures which will start in September. It is important that all persons desiring to join this Course file their applications before July* 1, *and thus receive the benefit of the preliminary work during July and August.*

SCHEDULE OF SUBJECTS.

It should be understood that the following schedule of subjects and syllabi of lectures are provisional merely, and subject to such changes as may be found necessary as the work proceeds. The student may, however, rest assured that only such alterations will be made as will add to the efficiency and completeness of the course.

JUNIOR YEAR.

SECTION A. 20 WEEKS.

Introductory.
Pharmaceutical Physics.
Chemical Notation and Nomenclature.
Inorganic Chemistry, Non-Metals.
Descriptive and Systematic Botany.
Special Topics.

SECTION B. 20 WEEKS.

General Pharmaceutical Processes.
Inorganic Chemistry, Metals.
Principles of Pharmacognosy.
Qualitative Chemical Analysis.
Special Topics.

SENIOR YEAR.

SECTION A. 20 WEEKS.

General Organic Chemistry.
Pharmaceutical Arithmetic.
Materia Medica, Beginning.
Special Topics.

SECTION B. 20 WEEKS.

Inorganic Chemicals of the Pharmacopœia.
Organic Chemicals of the Pharmacopœia.
Materia Medica, Continued.
Prescriptions and Dispensing.
Special Topics.

PRACTICAL STUDIES.

As far as possible the studies of the course will be directed into practical channels. Wherever the nature of the subjects will admit, the lectures will be accompanied with directions for the performance of experiments, either illustrative of the subject studied, or for the development of the student's powers of observation. These experiments will usually be of such a nature that the resources of the average drug store will be sufficient for their demonstration, thus affording the student some of the advantages of practical laboratory courses.

In the case of such subjects as Botany, Pharmacognosy and Materia Medica the student will be instructed how to obtain and properly use the materials for their illustration.

TOPICS COVERED BY THE OUTLINE OF LECTURES.

Only a partial outline of the regular lectures of the course can be given here, barely sufficient to enable the student to judge of the general character of the lectures and of the ground traversed. The topics of the numerous special lectures and papers are not included in this list, but will be announced from time to time in the pages of the Era.

GENERAL INORGANIC CHEMISTRY.

General Principles: The Properties of Matter, Elements, Compounds, Mixtures, Chemical Affinity, Atoms, Molecules, Chemical Notation and Nomenclature, Equation Writing, Laws of Definite and Multiple Proportions, Varieties of Chemical Activity, Nascent State of Elements, Analysis and Synthesis, Acids, Bases, Salts, Classification of the Elements, the Periodic Law, Allotropism.

CHEMISTRY OF THE NON-METALS.

The History, Natural Occurrence, Mode of Preparation, Physical and Chemical Properties, Principal Compounds, Methods of Identification and Pharmaceutical Uses of the Principal Non-Metals in the following order:

1. The Halogen Group.
2. The Oxygen and Sulfur Group.
3. The Carbon Group.
4. The Nitrogen Group.

CHEMISTRY OF THE METALS.

History, Natural Occurrence, Mode of Preparation in the free state, Physical and Chemical Properties, Principal Compounds, Methods of Identification, and Pharmaceutical Uses of the principal metals in substantially the following order:

1. The Alkali Metals.
2. The Alkaline Earth Metals, 1st division.
3. The Alkaline Earth Metals, 2d division.
4. Aluminium, Boron and the Rare Earths.
5. Iron, Cobalt, Nickel, Manganese.
6. Chromium Group of Metals.
7. Copper, Silver, Gold.
8. The Platinum Metals.

With each group will be given directions for easily performed illustrative experiments.

PHARMACEUTICAL PHYSICS.

The General Principles of Physics as applied to pharmaceutical and chemical processes. Weights and Measures, Specific Gravity, General Principles of Heat, Thermometry, Generation and Application of Heat, Solution, Solvents, Capillarity, Osmose, Dialysis, etc., etc.

GENERAL PHARMACEUTICAL PROCESSES.

A general descriptive outline of the principal physical processes made use of in pharmaceutical manipulation, as Evaporation, Desiccation, Distillation, Sublimation, Solution, Filtration, Crystallization, Granulation, Precipitation, General Principles of Drug Extraction, Comminution, Maceration, Digestion, Percolation, Expression, etc.

DESCRIPTIVE AND SYSTEMATIC BOTANY.

Organography and Gross Anatomy of Flowering Plants. Structure, Arrangement and Uses of the Organs of Vegetation and Reproduction. Plant Physiology and Chemistry, General Principles of Plant Classification, Principal Natural Groups of Plants, Methods of Identifying Common Flowering Plants, etc.

PHARMACOGNOSY.

General Principles of Morphology, Organography and Histology in their relations to Pharmacognosy. The Cell and Its Morphology, Cell Formation, the Products of Cell Life, Description of the Vegetable Tissues and Tissue Systems, Classification of Drugs according to their Physical Characters, with directions for preparing and using drug specimens for study.

ORGANIC MATERIA MEDICA.

The more important vegetable drugs receive individual attention, according to a convenient system of classification. Under each drug are considered Botanical Origin, Habitat, Histological Characters, Constituents, Physiological Properties, Uses in Pharmacy and Medicine, Official Preparations and Dose. Simple directions are given for the preparation and examination of specimens.

QUALITATIVE CHEMICAL ANALYSIS.

1. The General Principles of Inorganic Qualitative Analysis.
2. Preliminary Examination of Unknown Materials.
3. Grouping of the Bases.
4. Separation of Bases in Simple Mixtures.
5. Detection of the Common Acids.

Each lecture to be accompanied by simple directions for practical studies.

GENERAL ORGANIC CHEMISTRY.

The General Principles of Organic Chemistry, including a consideration of Empirical, Rational, Constitutional and Structural Formulæ, General Nature and Classification of Organic Compounds, the Hydrocarbons, Alcohols, Aldehydes, Mono- Di- and Tribasic Acids, Ethers, Carbohydrates, Amins and Amids, Cyanogen Compounds, Benzene Series, Benzene Derivatives containing Nitrogen, Alkaloids, Proteids, etc., with directions for simple experiments.

CHEMICAL AND PHARMACEUTICAL ARITHMETIC.

The Calculations of Molecular Weights, Percentage Composition from Molecular Formulæ, Calculation of Constituent in Fixed Amount of Compound, or of Compound to yield Fixed Amount of Constituent. Calculations Based on Equations, Calculations of Gaseous Weights and Volumes, and of Alterations in volume from variations in Temperature and Pressure. Weight, Volume and Specific Gravity of liquids and solids, their Relations and Calculations. Percentage Solutions and Mixtures, Alligation of Values, two or more constituents, etc., with numerous practical examples.

Inorganic Chemicals of the Pharmacopœia.

Under this title the inorganic chemical substances are taken up according to a convenient method of classification, and receive consideration in the light of their pharmaceutical applications. The points which are given prominence are: Methods of Manufacture and Purification, Tests for Identity and Impurities, Chemical and Physical Properties, Pharmaceutical and Medicinal Uses, etc. As in the preceding and following chemical studies, directions are given for the performance of numerous experiments in illustration of the subject.

Organic Chemicals of the Pharmacopœia.

Under this subject the organic chemical substances of the Pharmacopœia receive treatment in the manner described under the preceding title.

Prescriptions and Dispensing.

General Principles: The Nature, Construction and Component Parts of the Prescription. Origin of the Signs and Abbreviations used in prescribing. Grammatical Form, Interpretation and Treatment of the Prescription. Principles of Extemporaneous Pharmacy, Incompatibilities, Dispensing Difficulties and their Remedies. Methods of Numbering, Dating and Filing Prescriptions. Miscellaneous Dispensing.

Galenical Preparations of the Pharmacopœia.

Classification of Official Galenicals, and their Division into Groups and sub-Groups. Liquid Galenicals: Waters, Solutions, Syrups, Honeys, Mucilages, Mixtures, Infusions, Decoctions, Emulsions, Glycerites, Collodions, Liniments, Oleates, Elixirs, Spirits, Wines, Tinctures, Fluid Extracts, Vinegars, etc. Solid Galenicals: Extracts (Abstracts), Resins, Powders, Triturations, Troches, Confections, Masses, Pills, Suppositories, Cerates, Ointments, Plasters, Papers, etc.

OPENING OF THE SESSIONS.

NUMBER OF LECTURES, VACATIONS, ETC.

The regular lectures of Section A will begin with the first issue of the Pharmaceutical Era in September, and with the exception of two weeks' intermission at the Christmas holidays, will continue twenty weeks. The lectures of Section B will open with the first issue in March and will continue twenty weeks. Each issue of the journal will probably contain two lectures of the course, though the total number of lectures in each section will probably much exceed forty, owing to the numerous lectures and papers upon special topics, which it is purposed to furnish. The written recitations and examinations will, however, only be upon the lectures of the course proper.

According to the arrangement outlined above there will be two vacations in the year, one of two weeks in the winter, and a longer one in the summer.

EXPENSES.

1. All the regular lectures of the Course, also the additional lectures or papers on special topics, will be printed weekly in The Pharmaceutical Era, and will be free to all subscribers to this journal. The total number of lectures will be from 40 to 60 during each term of 20 weeks, and each student is required to become a subscriber to the journal in his own name.

2. The only additional charge to subscribers who wish to join the regular classes is a Registration Fee of $2 per term (10 cents a week). This amount is to cover the expense of the written recitations and examinations by direct mail with each student; for expenses of recording the grades of recitation and examination blanks, and incidental expenses of stationery, postage, etc.

3. An Era binder will be found of great convenience for preserving the copies of the journal as they are received, and these cost 75 cents each post paid.

4. The entire expense is as follows: Subscription to The Pharmaceutical Era for one year, $3.00; one Era binder, 75 cents; registration fees for the two terms, $4.00, making a total expense of only $7.75 per annum for each student.

TEXT BOOKS.

As a means of adding greatly to the benefit to be derived from his study of the lectures the student is advised to provide himself with at least one good text-book upon each of the principal subjects of the course. As a convenience to the student, a list of reliable works suitable for student's use is appended. Any one of the recommended texts will answer.

Any such books can be obtained from any general book store, or through the wholesale druggists.

GENERAL PHARMACY.

Caspari, Treatise on Pharmacy. $4.50. Lea Bros. & Co., Philadelphia.

Coblentz, Handbook of Pharmacy. $3.50. P. Blakiston, Son & Co., Philadelphia.

Oldberg, Home Study in Pharmacy. $3.00. The W. T. Keener Co., Chicago.

Remington, Practice of Pharmacy. $6.00. J. B. Lippincott Company, Philadelphia.

U. S. Pharmacopœia. $2.77. P. Blakiston, Son & Co., Philadelphia.

GENERAL PHARMACEUTICAL CHEMISTRY.

Bartley, Medical Chemistry. $2.75. P. Blakiston, Son & Co., Philadelphia.

Simon, Manual of Chemistry. $3.25. Lea Bros. & Co., Philadelphia.

Wulling, Pharmaceutical Chemistry. $2.00. John Wiley & Sons, New York.

Remsen, Organic Chemistry. $1.30.

BOTANY.

Bastin - College Botany. $2.50. G. P. Engelhard & Co., Chicago.

Culbreth, Pharmaceutical Botany. $3.00. Author, Baltimore.

Willis, Practical Flora. $1.50. American Book Company, New York.

Wood, Botanist and Florist. $1.75. American Book Company, New York.

PHARMACOGNOSY.

Rusby and Jelliffe, Essentials of Pharmacognosy. $2.50. D. O. Haynes & Co., New York.

Wall, Notes on Pharmacognosy. $1.50. Meyer Bros. Drug Company, St. Louis.

MATERIA MEDICA.

National Dispensatory. Full sheep. $8.00. Lea Bros., Philadelphia.

U. S. Dispensatory. Full sheep. $8.00. J. B. Lippincott Co., Philadelphia.

Sayre, Organic Materia Medica. $4.00. P. Blakiston, Son & Co., Philadelphia.

PRESCRIPTIONS AND DISPENSING.

Scoville, The Art of Compounding. $2.50. P. Blakiston, Son & Co., Philadelphia.

Wall, The Prescription. $1.50. Aug. Gast Bank Note and Lithograph Company, St. Louis.

ANALYSIS.

Prescott and Johnson, Qualitative Analysis. $3.50. D. Van Nostrand Company, New York.

Schimpf, Volumetric Analysis. $2.50. John Wiley & Sons, New York.

CHEMICAL NOTATION AND PHARMACEUTICAL ARITHMETIC.

Beal, Notes on Equation Writing and Chemical Arithmetic. 75 cents. Nitschke Bros., Columbus.

HOW TO PURSUE THE ERA COURSE IN PHARMACY.

The benefit derived from any course of study depends largely upon the system and regularity with which it is pursued. All study is beneficial, even when haphazard or irregular, but never so much so as when intelligently directed and regularly followed up. The prime object of The Era Course in Pharmacy is to afford the opportunity of such regular and systematic study under the direction of teachers of large experience and familiar with the needs of students.

The student will undoubtedly derive great benefit simply from the careful perusal of the weekly lectures of the course, but this benefit will be a minimum as compared with that which he may receive from conscientiously following out the program of exercises as arranged. The most important part of this programme is the regular weekly study of the lectures as they appear, and the giving of faithful attention to the written quizzes and examinations. No student can so thoroughly acquaint himself with the contents of the lectures that he cannot gain something more by the attempt to place his knowledge upon paper in the form of a written recitation. The recitation is not only the proof of the student's having carefully studied the lectures, but it is the most effective means of developing that knowledge, and of permanently fixing it in his memory.

How to Study.

First of all, have regular hours of study. A few minutes bestowed regularly each day will be of greater benefit than hours of irregular and desultory reading. To thoroughly master the subject matter of a lecture will require about three perusals; first, an easy reading to discover the general scope and arrangement of the subjects treated of, then a very careful study to discover thoroughly the teaching of each paragraph, and, finally, another general review to classify the whole and bring out the connections and relations of its various parts.

After the substance of the lecture has been mastered, the student may profitably bestow any remaining time upon the reference texts which accompany the lectures. It is well, however, to defer this reference until after the lecture has received its full consideration. The objection to the reading up of references before the lecture has been mastered lies in the temptation to desultory and careless reading, to the neglect of general principles.

As each recitation blank is received the questions should first be gone over carefully so as to discover their full meaning, and the answers then written, if possible, from memory. If in doubt as to an answer, the student should recur to the lecture and again go over the difficult portion very carefully.

Make all answers brief and to the point, but do not omit important particulars. Do not presume upon the knowledge of the quiz master and leave it to him to guess at your meaning. Answer all questions as if you were explaining the matter to some person entirely unacquainted with the subject.

Write neatly and plainly, and be careful to spell all words correctly.

Try not only to study *about* things, but as much as possible study *things* themselves. When an experiment is given, or a reaction described, make an attempt to perform the experiment and to obtain the reaction.

When a drug is under consideration, no matter how often you have handled that particular substance before, obtain a sample and observe it in connection with the lesson. Note its general appearance carefully, distinguish all the different parts visible to the eye or by means of a simple magnifier, smell it, taste it, examine its preparations and note their properties and doses.

It will be profitable to have at hand a good dictionary, and to consult it whenever a new or unfamiliar term occurs.

If after a careful search for the answer to a question it is not found, ask some one who knows, but always first make an earnest effort to discover the answer for yourself.

To the untrained student some of these directions may seem trifling or unnecessary, but it will be among those who most clearly appreciate their significance and conscientiously follow them out that the prize winners will be found at the end of the course.

PRIZES.

As a stimulation to students to put forth their best endeavors, and to take the highest rank possible in their studies, a number of prizes will be awarded at the close of each section of twenty weeks. This list of prizes will be so liberal in number that any student who faithfully follows the course in the manner herein advised may reasonably hope to be found among the prize takers. The names of such successful students will be published in the Pharmaceutical Era.

What these prizes are to be will be definitely announced at a subsequent date before the opening of the course.

APPLICATION FOR MATRICULATION.

OFFICE RECORDS.
No. __________
PAGE __________

THE PHARMACEUTICAL ERA,
106 Fulton St., NEW YORK.

____________________ 1897

Dear Sirs :—Please enroll me as a matriculant for one year in

THE ERA COURSE IN PHARMACY FOR 1897-8.

I am __________ years of age and have had __________ years experience in a drug store.

I am __________ with the drug firm of __________
(PROPRIETOR OR CLERK.)

I have been registered as __________ in the State of __________
(PHARMACIST OR ASSISTANT.)

Enclosed find __________ for $7.75* to pay for matriculation and 1 year's subscription to
(N. Y. DRAFT, P. O. OR EXPRESS MONEY ORDER.)

The Pharmaceutical Era (July 1, 1897 to June 30, 1898) also 1 Era Binder.

Full Name __________

Address __________

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*Each member of this course must be a subscriber in his own name and paid to June 30, 1898. If already a subscriber you need only remit sufficient amount (25 cents a month) to carry your subscription to June 30, 1898. If you have or don't want an Era Binder deduct 75 cents.

THE PHARMACEUTICAL ERA

[*WEEKLY.*]

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SPECIAL NOTICES.

BACK NUMBERS WANTED.

We will pay 15 cents each for copies of the Era of the following dates delivered to this office:—

June 1, 1894.
May 9, 1895.
January 2, 1896.
April 23, 1896.
May 14, 1896.

WARNING.

The two young men who have been visiting New Orleans druggists representing that they are agents of the Era commissioned to take photographs of the drug stores, etc., have no authority for such acts whatsoever from this journal. We know nothing of them. We have learned that one or two druggists have been victimized by them, but not to any great extent, simply the cost of two or three copies of the photographs. It is hard to see why the name of the Era is used, save to act as a reputable introduction.

PRICES CURRENT.

We introduce in this issue a new Prices Current of drugs and chemicals. It embraces those staple articles of general employment by druggists which vary more or less in price, but does not include articles which have a fixed price, the new synthetic remedies, proprietary preparations and the like. This list will be kept closely corrected each week up to the date of issue, giving all the market fluctuations as they affect retail prices. By comparison weekly of this list with the larger Price List Edition, No. 2, of the Era, subscribers may be kept fully posted on market fluctuations, and the larger list should be corrected in accordance therewith. We shall be thankful for any suggestions looking toward the improvement of this Prices Current.

Poisons Illegally Sold in Massachusetts.

A year ago Massachusetts passed a new pharmacy law. With regard to the sale of poisons it differed materially from the one in force previously. Instead of applying its restrictions to druggists only, it is much more general in scope, providing that "whoever" sells arsenic, laudanum, Rough on Rats, or any one of a long list of poisons, or poisonous solutions, shall keep a record of the sale, the name and amount of the article sold, and the name and residence of the person or persons to whom it was delivered. This record is to be made before the article is delivered, and is to be open at all times to inspection by the police, under penalty of a fine of fifty dollars.

This general application of the law was brought about by the druggists, who themselves were subject to its provisions before the grocers and general storekeepers began to sell poisons in any noticeable amount. When these stores, and the large department stores in cities, began to encroach on the field of the druggist by selling certain poisons in popular use, the druggist demanded that no discrimination be shown, and that all who sold poisons in any form be subjected to the same restrictions.

But trouble is now being caused by the one or two exceptions in the law, the chief of which is that which exempts from its provisions all who sell poisons at wholesale only. It is said that country storekeepers, particularly, are taking refuge behind it in their selling of Paris green for use on the potato bug; and it is also claimed that, under that exemption, rough on rats' is being sold by those who do not register their sales, but who are not bona fide wholesalers. In other words, while the law as it appears on the statute books makes no distinction between druggists and general dealers in the matter of selling poisons, in practice the druggists comply with the requirements concerning registration of sales, while the general dealers still avoid it.

The Board of Pharmacy is looking into the matter very thoroughly, and will rigidly enforce the law. Similar laws in all our States would give the public and the druggists more of that protection to which they are entitled.

No More Free Medicines for the Well-To-Do.

The indiscriminate charity of the free dispensaries in large cities is a positive evil. It tends to pauperize well-to-do patients and starve pharmacists and physicians. The first complaint from the ranks of pharmacy has come from the druggists in the crowded East Side of New York City. This neighborhood, now swarming with Polish, Italian and other foreign populations, offers an alluring field for charitable work, and the fact that the very houses in which many wealthy New Yorkers were born and reared are now occupied by these aliens, makes it comparatively easy to raise funds for their improvement. Thus the East Side doctors and druggists have felt the exhaustive drain upon business afforded by free treatment, as the druggists and physicians in other parts of the city have not yet felt it. The result has been the organization of the New York Retail Druggists' Association in that quarter of the town to combat the dispensary evil. The movement is bound to spread among pharmacists elsewhere, for it is a live problem, affecting their bread and butter.

But the physicians of New York realized the danger of this free medical treatment sooner than the druggists did, and both the great medical societies here have been stirred up over the question how to prevent well-to-do citizens from going to the charity dispensary for treatment, and sending their families there. The secret of the attractiveness of the dispensary is not that it is a charitable institution, but that the medical treatment is supposed to be superior and at the same time cheap, or free. A "professor" of wide newspaper reputation diagnoses the case in thirty seconds, and prescribes something of which a five-gallon demijohn is kept on the shelves of the dispensary pharmacy. As has been well said, if the patient is required to pay ten cents for this, his chest expands—he can no longer be counted a pauper—and he goes away with the proud consciousness that his debt to the faculty has been paid.

The department store cuts off profits, but the free dispensary gives away both capital and profits, and little help in correcting the evil may be expected from the managers of the dispensaries. It is to their interest to swell the number of cases of free treatment so as to gratify the charitable supporters of the institution with an exaggerated idea of the amount of good they are doing.

The fact that these institutions are many of them supported, not only by private subscriptions, but also by public moneys, varying in amount with the number of patients treated, suggests one way of repressing the abuse, and that is through the legislature, which makes these appropriations. Already a beginning has been made to pass laws restricting free treatment to those patients who are really too poor to hire a doctor. The New York County Medical Society, through a committee, had a bill passed at the last session of the legislature, but it failed of becoming a law through the neglect of Governor Black to sign it. This may have been due to the large number of bills which required his signature and to the brief time—thirty days—allowed him by law for examining them and attaching his signature, or it may have been due to the fact that the proposed measure was a novel one which deserved a longer discussion before being placed on the statute books. The bill was not entirely satisfactory, even to the physicians themselves, but it was a starter, and showed that an abuse existed and should be corrected. The experience gained will be useful in framing desired future legislation.

Many physicians claim that it would be illegal, unconstitutional, to take away the right to conduct a dispensary, but they believe the evil can be scotched by withholding the large appropriations which now make it possible for many of these institutions to give free advice and treatment to every Tom, Dick and Harry applying. Druggists can assist the doctors very materially if they will, in bringing about the reforms so imperatively needed in this matter. Charity of the proper sort is to be commended, but the sort of thing here complained of is all wrong. It benefits but few, and on the other hand, injures the very ones, the people, it is supposed to protect and aid.

"She Took it and Died."

The genius who is furnishing items for the newspapers to "scatter through the news pages every day" upon the substitution matter has composed the following:

"Recently a woman in New York City, who went into a store to buy a well-known medicine, was persuaded to take something 'just as good.' She took it and died. A suit for damages is now pending."

Far be it from us to indulge in levity over an occurrence so distressing, but there is an exasperating meagerness in the details which arouses curiosity. What an opportunity has been missed for a column story which any newspaper would be glad to spread rather than "scatter" through the news pages. What a glorious opportunity for the reporter to trace the lineage of this unfortunate woman back to Mrs. Gamp's friend, Mrs. Harris, and to show her connection with that other famous lady who "kept tavern out West." The incident is peculiarly unfortunate, even to its handling.

Human nature is weak, and a proneness to cheat in examinations is a striking evidence of this weakness familiar to all board and college of pharmacy examiners. Some one will try to ride a pony through the examination, and all the others, honest ones, willing to walk, must be watched and suffer for his desire for illegitimate equestrian exercise. All manner of methods to prevent cheating before and during examinations are and must be tried. A rather unusual one, however, is that now under sober discussion by a couple of our Canadian contemporaries, namely, that "on the morning that the examination commences, the manuscript for the examination papers be placed in the hands of the printers *after* the students are assembled in their room. Thus all possibility of the questions being known beforehand is avoided." Canadian examiners are either very leaky or careless, if such a ridiculous proceeding as this is necessary, and they are poorly complimented by the proposition. Canadian printers, too, must be a dishonest lot, by the same token, though, by inference, they are remarkably rapid workmen, a sop of compliment which puts them ahead of the examiners. But think of "the students assembled in their room." Must they wait for composition, proof-reading, revision, and printing of the questions, full of technical difficulties and delays to the printers, several hours, perhaps a day, under surveillance of examiners and aides? Are they criminals? Well, what's the use of surmising? The brain grows dizzy at contemplation of the long vista of speculation opened by this remarkable proposition.

Newport News, Va., has a city ordinance pertaining to the observance of the Sabbath which has brought trouble to one druggist. He sold a certain widely advertised article at his soda fountain, and was arrested for it. His defense was that the article was a medicine and not a beverage, and that therefore he had a perfect legal right to dispense it at his soda fountain on Sunday. Two other druggists agreed with him, but a third testified that it was advertised as a beverage and was not in the stricter sense of the word a medicine. As the article is advertised as both medicine and beverage, the judge found it difficult to render a decision, and accordingly reserved it. Whether it has been handed in yet we have not learned. The moral of the case seems to be that advertisers of specialties must be a little more careful in the wording of their advertisements which are to be circulated in communities blessed with peculiarities of rules of government, such as Sunday observance, liquor regulations, prohibition, local option and the like.

It is rank heterodoxy to suggest a lowering of prices to the druggist, but he handles some things that the farmer uses for destroying insects and other vegetable pests. The government publishes much information upon the subject, and incidentally suggests about what the farmer should pay. He will not pay prescription prices. He will let the bugs live rather than do it. He will be a liberal buyer if the price suits him. In this case there is business sense in large sales and small profits.

The individual who steps jauntily from the train, with packages or bulging grip and satisfied smile, is not necessarily the drummer, the new summer boarder or the recent graduate. He may be the druggist returning laden with prizes from his State association's athletic contests.

A Wisconsin druggist is charged with putting chloroform into a prescription calling for spirits of chloroform, the patient being seriously affected thereby. He claims to be able to prove, and apparently does prove, that he compounded the prescription correctly. Possibly the explanation is that the physician had not been accustomed to using genuine, full strength spirits of chloroform, and was astounded by the amount of chloroform his prescription really contained when compounded properly. The result from doing a thing correctly is sometimes quite startling, if one has been accustomed by long usage to consider faulty methods the proper ones. Give the druggist a show, and don't believe him guilty till proven.

If the country newspaper can afford to print four reading notices on substitution for $100 worth of foreign advertising, how many free reading notices can it afford to print for the same amount, or more, or even less, of local druggists' advertising?

The treasurer, A. S. Covel, of the J. C. Ayer Company, Lowell, Mass., retired from that position on June 1, and the directors of the company have appointed as his successor Alfred E. Rose, advertising manager for Scott & Bowne, of New York.

The inefficient clerk is usually found in the same store with an inefficient proprietor. There seems to be an affinity which binds these two unfortunates.

Correspondence.

We are pleased to publish here communications from our readers on topics of interest to the drug trade. Writers are requested to express their views as briefly as possible. Each article must be signed by its writer, but his name will not be published if so requested.

The Sale of Poisons and Liquors in Pittsburg.

To the Editor.

By the enclosed copy of the act regulating the sale of poisons you will observe that in Pennsylvania any person is permitted to sell poison provided the poison sold is properly labeled, and that in case the poison sold is of such potency as to be fatal to adult human life in doses of five grains or less the sale must be registered.

The writer has consistently opposed the indiscriminate sale of morphine and cocaine and often has lost profitable customers by so doing. Of late years the demands for morphine pills have been so frequent that it has been anything but pleasant to explain our position in reference to these drugs.

It is my opinion that no law, no matter how stringent, would tend to decrease the use of narcotics to any great extent; the laity are now apparently more or less acquainted with the properties of narcotics, even school children eight years old are taught of the properties of the juice of poppies, the salts of coca leaves, etc.

The druggist of this State is not obliged to pay a license for the sale of intoxicating liquors, provided they are sold on a physician's prescription, which prescription is not subject to renewal; a fine of $500, and imprisonment for six months is imposed for violating this provision, but this severe penalty does not deter many druggists from selling without a prescription.

A PITTSBURG DRUGGIST.

Thankfully Received.

Frankfort, Ky., June 12, 1897.

To the Editor: Permit me to heartily commend you for your manly and sensible editorial under the caption of "More About Substitution" in your issue of June 10. I hope every retail druggist and every proprietary manufacturer in the United States will read it. What you say is timely and admirably spoken; it has the proper ring, and leads off on the right lines. Yours truly,

J. W. GAYLE.

*ARTIFICIAL LIGHT: MODERN METHODS COMPARED: ELECTRIC, INCANDESCENT, WELSBACH, ACETYLENE.**

BY PROF. D. S. JACOBUS, STEVENS INSTITUTE OF TECHNOLOGY, HOBOKEN, N. J.

Experiments were made showing the appearance of colors when viewed under the various lights. Some colors were shown more perfectly under one light and some more perfectly under another. The Welsbach lamp failed in showing delicate shades of pink, and an experiment was made to show that it tended to give a yellow tinge to the complexion, whereas the acetylene light gave an effect much more lifelike than the Welsbach lamp.

To show the appearance of various colors when viewed by the different lights, two surfaces of the same color were held up at an angle between two sets of light, each set containing eight lamps or burners. The two sets of lights to be compared were placed at a distance of about six feet from each other on the lecture table. Screens were placed in front of the burners to shield the eyes of audience from the direct glare of the lamps. In the space between the lamps colors were shown on large pieces of cardboard, doubled over at the middle, so that the two sides could be held at an angle to each other. This allowed one surface to be illuminated by one set of lamps and one by the other. The audience could observe each surface at the same time and thus compare the colors as they appeared to the eye.

Similar experiments were made before the lecture, in which the various lights were compared directly with daylight. These also showed that the Welsbach lamp failed in bringing out delicate shades of pink.

A second series of experiments consisted in viewing colors of a slightly different hue, which would appear of nearly the same hue when held in one position between two sets of lamps, and of a widely different hue when the colors were reversed so as to be lighted by the opposite set of lamps.

The relative rates of consumption of gas for a given candle power was next discussed, together with the heat produced and the contamination of the atmosphere by the products of combustion. The Welsbach was shown to save 70 per cent. of the gas used by an ordinary flat flame burner for an equal amount of illumination. Acetylene gas was shown to be ten times as powerful an illuminant as ordinary water gas, or a burner using one cubic foot per hour would produce forty candle power.

The explosive properties of acetylene were discussed, and numerous instances were cited where acetylene compressed in tanks under a heavy pressure, so as to become a liquid, had exploded with fatal results. An instance was also cited where a machine generating acetylene at atmospheric pressure had exploded, killing two persons. In the case of the liquefied acetylene under a heavy pressure the explosion is similar to that of dynamite or ordinary gunpowder; that is, the elements will decompose without the presence of air. If the acetylene is not at a pressure greater than that of the atmosphere, however, such decomposition is impossible, and the acetylene must be mingled with air before there can be an explosion. Experiments were made in which acetylene and ordinary illuminating gas were exploded when mingled with air. The gas was allowed to escape from a burner into a partly confined space. The explosion produced by the acetylene was much more severe than that produced by the illuminating gas.

Calculations of the relative costs, in the city of New York, for equal illumination were presented. The incandescent electric light cost one cent per lamp of 16 candle power per hour. Ordinary illuminating gas at $1.25 per 1,000 cubic feet cost 0.5 cent, and the same burned in a Welsbach burner 0.17 cent. The cost of replacing the mantles of the Welsbach burners was included in the estimates. The difference of cost in favor of the Welsbach will disappear, to a great extent, in practice, for if ordinary gas burners are replaced by the Welsbach, the total amount of illumination, as a rule, becomes greater, and if three times as much, the cost of gas to the consumer per month would be the same with the Welsbach as it was with the ordinary gas burner. To compete with ordinary illuminating gas selling at $1.25 per 1,000 cubic feet in municipal distribution, calcium carbide, the commercial source of acetylene would have to be sold to the gas company and converted into gas for $40 per ton to net the gas company the same profit, and to be as economical to the consumer as ordinary water gas burned in flat flame burners. To be as economical to the consumer as ordinary gas burned in Welsbach burners it would have to be furnished to the gas burned in Welsbach burners it would have to be furgas companies and converted into acetylene gas for $19.50 per ton. The ordinary mains now used for transmitting illuminating gas would not be suitable for acetylene on account of the leakage If one-tenth the amount of acetylene were used, as with ordinary gas, the percentage of leakage, based on the amount of gas used by the consumers, would be increased about tenfold, or if the percentage of leakage in a system had been 5 per cent. with ordinary gas, it would be about 50 per cent. with acetylene of the gas used by the consumers, or 33 per cent. of the gas stored in the holder.

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*Abstract of lecture delivered at Franklin Institute, March 12, 1897.—Prog. Age; Sci. Am.

It was further shown that to be as cheap as kerosene in domestic lighting the calcium carbide would have to be supplied to the consumer at $45 per ton, and the compressed liquid acetylene would have to be supplied at 6½ cents a pound.

It would not be profitable, as has been suggested in some literature on the subject, to convert electric lighting plants into plants for producing calcium carbide, the gas from which could be used for lighting, because the light given by the carbide so produced will be but one-half that obtainable by using the electricity directly in incandescent lamps.

The cost figures show that for an equal illumination the electric incandescent light costs twice as much as gas when the latter is burned in flat flame burners. The incandescent electric light has, however, held its own against the gaslight on account of its superior qualities, which are its brilliancy, cleanliness and adaptability. The electric light is also preferable on account of the fact that it does not vitiate the atmosphere with carbonic acid gas, and that it produces a less heating effect than ordinary illuminating gas. It also eliminates the danger of asphyxiation through an accidental leakage of gas. That the incandescent electric light has held its own at a higher cost to the consumer for a given candle power is a proof that other elements enter into the problem of artificial lighting as strongly as the cost of a given amount of light. From this standpoint it may be argued that acetylene, producing as it does a more brilliant light than any now used for interior lighting, and having the quality of showing the complexion in lifelike tints, will have its own field, even should it be the most costly system of illumination.

Again, acetylene is now used in place of the calcium light for lantern projections, etc. Were it not for the explosive character of the compressed acetylene, it would be useful for cases of isolated lighting, such as for beacons and light buoys.

The figures of cost for equal illumination also show that the Welsbach lamp produces about three times the illumination for a given cost as ordinary illuminating gas burned in a flat flame burner. As has been already stated, however, the Welsbach lamp is deficient in showing the complexion in lifelike tints. For most classes of work this defect is not of great enough importance to outweigh the advantage derived from its great economy.

The whole situation may be summed up by saying that each system of lighting has its own field of usefulness on account of properties peculiar to itself, which make it more desirable than the others for certain classes of work.

FOOD COLORS.

Among the important questions that have arisen in consequence of the attention given to the composition of food products, is that of artificial coloring. Much of the coloring of food is traditional and æsthetic and is not intended to deceive. Thus candies are obviously colored to please the eye, especially giving variety to the confectioner's stock; butter and mustard are colored without any intention to deceive as to quality or purity. Of course the imitations of such articles are also colored, but the primary intention to deceive is in the manufacture of the substitute. On the other hand colors are often used to conceal inferiority or falsification. Skimmed milk is colored to give the appearance of richness; dilute alcohol is colored to imitate wine, and acetic acid is colored to imitate cider-vinegar. The sanitary chemist must carefully distinguish between these two purposes in the case of colors. With candies, butter, mustard, and similar instances, the question is the wholesomeness of the color used, but the coloring of milk or spirits is essentially a deception to the injury of the buyer or user and may be prevented on that basis alone without reference to the wholesomeness of the color used.

When we come to consider the question of the wholesomeness of colors we meet some serious difficulties, and very liable to do serious injustice unless we keep clearly before us the object of the inquiry. It is now generally known that most colors are artificial products derived from coal tar. They are commonly designated "aniline colors," but many of the most used forms are not made from aniline. It is, therefore, rather more exact to designate them as the coal tar colors. There are very many forms, and the number is rapidly increasing, as the result of the scientific research carried on in Germany, which has long led the world in this industry. The composition of these colors is generally highly complex, and their systematic names long and awkward, for which reasons they are generally sold under trade names that give no indication of their composition or relationships. The colors produced in the earliest period of the industry were not permanent and were liable to dangerous impurities, especially arsenic, but the modern products are more permanent and purer. Features that are common to many are solubility in water and high coloring power. These make them suitable for use in food, and we find, therefore, that they have come largely into use as food colors, and the detection of them and judgment of their effects are often problems presented to the food analyst.

Concerning the physiologic effects of the best known colors when administered in appreciable doses there is scarcely any trustworthy literature except that found in a work by Theodore Weyl. These investigations were carried out in the manner usual in laboratory investigations in physiology and therapeutics, that is, upon the lower animals, principally dogs and guinea-pigs, by regular or forced feeding, or by subcutaneous of intra-abdominal injection. It is obvious that all injection experiments made prior to the introduction of antiseptic precautions are valueless, since the possibility of microbic infection is not eliminated. There are, however, other sources of error in these methods to which attention should be strongly directed. In many cases the doses given are out of all proportion, and the effects in such doses cannot justly be considered as indicative of the effects when used in food. Thus Weyl in studying the action of the color commercially known as Soudan I (anilin-azo-beta-naphthol), which has been used for coloring butter, oils and liqueurs, administered to a dog weighing 11,900 grams (27 pounds) four doses, two grams (thirty-one grains) each, at intervals of two days, until eight grams had been taken, then after an interval of eight days raised the dose to five grams (seventy-seven grains), and found after two doses had been given that there was a slight disturbance. He concludes that the color is not entirely harmless, but it seems to us that such an inference is unfaird. A dose of 77 grains in such cases as these to an animal weighing 27 pounds is equivalent to about one ounce to a male adult, a dose more than a thousand times as great as that likely to be taken, for it appears from figures in our possession that the proportion of color used in different articles is so small that much less than a grain will color the amount of food usually eaten at a meal.

We must also throw to one side all experiments by subcutaneous or intra-abdominal injection, for these are not the methods by which the colors are introduced into the human system, and it must be very difficult, even under common antiseptic precautions, to eliminate the influence of microbes which may be mixed with the color itself.

A similar error effects some obstructions lately published tending to show that food colors interfere with the action of digestive agents. This is an interesting field of inquiry, but in the experiments published the doses used were too large; the smallest amount employed was about one grain, whereas when that color is used for jams and jellies, for which it is quite popular, the amount is such that several ounces of the material would have to be eaten to include one-third of a grain of the color.

It is our opinion, therefore, that there is no good reason for regarding the standard coal tar colors as unfit for use in food. The quantity is so small that it is not reasonable to suppose that any toxic effect will follow. The probability is that many of these colors are analogous in composition to those found naturally in fruits, flowers, and seeds, and it is mere assumption that the natural colors are more wholesome than the artificial. Of course, it is taken for granted that the colors are free from mineral impurities; that point can be readily ascertained, and the commercial colors are now almost all satisfactory in this respect. All the coal tar colors, being organic, are readily decomposed in the system, and hence cannot act as cumulative poisons. It seems, therefore, that it is at present merely the duty of sanitary authorities to ascertain what colors are used and in what amounts, and that restrictive action is not called for.—Dietetic and Hygienic Gazette.

AROMATIC SYRUP YERBA SANTA. Mr. Huber (Proc. Ill. Ph. Assoc.) says that aromatic syrup of yerba Santa, N. F., has not been satisfactory in his hands on account of its alkalinity which, in mixtures containing it as a vehicle to disguise quinine sulphate, causes the quinine to deposit on the sides of the container. He finds the following formula to make a preparation free from the foregoing objection, its taste-making properties are not equalled by any, and it keeps well:

Yerba Santa (No. 30)	240 grains
Licorice root (crushed)	240 grains
White oak bark (crushed)	120 grains

Infuse the drugs with eight ounces of boiling water and allow to stand 24 hours, then filter through a double filter paper. Receive 7 ounces of filtrate. Add

Sugar	12 tr. ounces
Oil lemon	2 drops
Oil cloves	4 drops
Oil sassafras	2 drops
Glycerine	1 fl. ounce

Mix all together and, if necessary, add water to make up to 16 fl. ounces.

(Concluded from Page 685, June 10.)

LIST OF REACTIONS AND REAGENTS ACCORDING TO NAMES OF AUTHORS.*

II.

Index of Substances.

ACETANILID: Hirschsohn, Schroeder, Vulpins.

ACETONE: Gunning, Jolles, Légal, Le Noble, Lieben, Penzoldt, Reynold.

ACIDS: Geogehan, Mohr, Uffelmann.

ACONITIN: Arnold, Herbst, Wright.

ALBUMIN: Adamkiewicz, Almén, Axenfeld, Berzelius, Boedecker, Bruecke, Christin, Esbach, Frohn, Fuerbinger, Gautier, Geissler, Gouvers, Guezda, Hager, Heller, Heynsius, Hoffmann, Jolles, Kintschgen-Gintl, Liebermann, Mehu, Mesnard, Millon, Mulder, Oliver, Panum, Posner, Rafaele, Raspail, Reichl-Mikosch, Riegel, Robert, Roch, Rose, Schultze, Spiegler, Stuetz, Tanret, Wurster, Zacharias, Zuelzer.

ALCOHOL: Baumann, Berthelot, Dragendorff, Hager, Jacquemart, Lieben, Puscher, Tscheppe, Yvon.

ALDEHYDE: Fischer, Guyon, Nessler.

ALKALI: Dobbin, Schweissinger.

ALKALOID: Arnold, Biel, Bouchardat, Brouardel, Buckingham, Delf, Dragendorff, Erdmann, Errera, Formanek, Fraude, Froehde, Frohn, Godeffroy, Godeffroy-Laubenheimer, Grandeau, Hager, Jorissen, Jungmann, Koehler, Langley, Langley-Koehler, Lepage, Lindo, Luchini, Mandelin, Mangini, Marmé, Masin, Mayer, Neumann-Wender, Planta, Rossbach, Scheibler, Schlagdenhauffen, Schulze, Schwarzenbach-Delf, Selmi, Sonnenschein, Stas-Otto, Thresh, Trotarelli, Vitali, Wagner, Wender, Wenzel, Winckler.

ALOES: Borntraeger, Cripps.

AMINE: Hoffmann, Hofmann.

AMMONIA: Bohlig, Einbrodt, Nessler.

ANILINE: Beissenhirtz, Duflos, Hofmann, Jacquemin, Letheby, Rosenstiehl, Runge.

ANTIMONY: Hager.

ARSENIC: Bettendorf, Davy, Fleitmann, Flueckiger, Gutzeit, Hager, Himmelmann, Hume, Marsh, Reichard, Reinsch, Scheele, Schlickum, Schneider.

ASPIDOSPERMINE: Fraude.

ATROPINE: Arnold, Gerard, Vitali.

BALSAMS (also Resins): Flueckiger, Hirschsohn, Klunge, Plugge, Storch.

BEER COLORS: Schuster.

BILIARY ACIDS: Bischoff, Drechsel, Neubauer, Pettenkofer, Strassburg.

BILIARY COLORS: Bruecke, Capranika, Deubner, Dragendorff, Ehrlich, Fleischl, Gerard, Gmelin, Hilger, Hoppe-Seyler, Huppert, Jolles, Krehbiel, Lewin, Maréchal, Masset, Paul, Rosenbach, Rosin, Smith, Ultzmann, Vitali.

BISMUTH: Léger, Schneider.

BLOOD: Almen, Danielewsky, Gauther, Heller, Heller-Teichmann, Huehnefeld, Ladendorf, Lecchini, Melassez, Schaer, Schoenbein, Selmi, Struve, Teichmann, Van Deen, Vitali, Weber.

BROMINE: Castle.

BRUCINE: Frande, Lyon.

BUTTER: Bischoff, Drouot, Hager, Jahr, Schoenvogel.

CAFFEINE: Stenhouse.

CANTHARIDIN: Eboli.

CARBOHYDRATES: Molisch, Udransky-Baumann.

CARBON MONOXIDE: Hoppe-Seyler, Preyer, Salkowsky.

CELLULOSE: Dahlmann, Hoffmeister, Lifschütz, Schulze.

CHINOLIN SALTS: Anderson.

CHLORAL HYDRATE: Hirschsohn.

CHLORINE: Villiers.

CHLOROFORM: Hoffmann, Neubauer, Vitali, Yvon.

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*From compilations of Dr. Altschul (Phar. Centralhalle).

CHOLERA BACILLI: Koch.

CHOLESTERIN: Hager, Liebermann, Salkowsky.

CINCHONA BARK: Grahe.

CINCHONIDIN: Schaefer, Schiff.

COCAINE: Biel, Giesel, Greittherr.

CODEINE: Tattersal, Weppen.

COD LIVER OIL: Boudard.

COGNAC: Wiederholt.

COLCHICIN: Hager, Snow, Yvon, Ziesel.

CONIIN: Arnold.

COPPER: Cailletet, Schoenbein.

CREATININ: Jaffé, Salkowsky, Weyl.

CURCUMA: Howie, Maisch.

CYANATES: Schneider.

CYANIDES: See Hydrocyanic Acid.

CYSTIN: Liebig, Mueller.

DEXTRINE: Lippe.

DIAMINES: Baumann.

DIAZO COMPOUNDS: Liebermann.

DIGITALIN: Grandeau, Keller, Lafon.

EMETIN: Podwyssotsky.

EXCREMENT: Finkelnburg, Griess.

FLUORINE: Brand, Hefelmann, Nivière.

FORMALDEHYDE: Tollens.

FUCHSINE: Valentine.

FURFUROL: Jorissen.

FUSEL OIL: Jorissen.

GALLIC ACID: Young.

GLUCOSE: Axenfeld, Agostini, Almén, Arndt, Barfoed, Barreswil, Basoletto, Boettger, Braun, Bruecke, Campani, Capezzuoli, Conradi, Dudley, Einhorn, Fehling, Fiebig, Fischer, Focke, Frommherz, Hager, Haine, Heinrich, Heller, Hoppe-Seyler, Horsley, Jack, Johnson, Knapp, Krueger, Lehmann, Leismer, Loewe, Loewenthal, Maumené, Mohr, Moore, Mulder, Neumann-Wender, Nylander, Oliver, Ost, Otto, Pavy, Pellet, Pelouze, Penzoldt, Purdy, Rubner, Sacchse, Schmidt, Seegen, Soldaini, Tollens, Trommer, Violette, Vogel, Wayne, Wender, Worm-Mueller, Zuelzer.

GLUCOSIDES: Brunner.

GLYCERINE: Boettger, Hager, Linde, Reichl, Ritsert.

GRAPE SUGAR: See Glucose.

HARDENING MEDIUMS: Erlicki, Mueller, Perenyi, Remak.

HIPPURIC ACID: Luecke.

HOMATROPIN: Arnold.

HORSE FLESH: Braeutigam.

HYDROCARBONS: Fritsche.

HYDROCHLORIC ACID: Contejean, Günzburg, Mohr, Schuchardt, Uffelmann, Villiers.

HYDROCYANIC ACID: Froehde, Hlasiwetz, Ittner, Lassaigne, Liebig, Payer, Schoenbein-Pagenstecher.

HYDROGEN PEROXIDE: Bach, Boettger, Deniges, Kassner, Schoenbein, Traub, Wurster.

HYOSCYAMINE: Gerrard.

HYPOCHLOROUS ACID: Kolter.

INDICAN: Hammarsten, Jaffé, Obemeier.

INDOL: Bayer.

INOSITE: Gallois, Scherer, Seidel.

IODINE: Castle, Jolles, Sandlund.

IODOFORM: Greshoff, Lustgarten.

LEUCIN: Scherer.

LIGNIN: Hegler, Hoehnel, Wiesner.

LUBRICANTS: Holde, Schweitzer.

MACERATING MIXTURE: Schultze.

MAGNESIA: Schaffgot.

MARTIUS-YELLOW: Schaeffer, Vitali.

MEHL: Vogl.

MINERAL ACIDS: Huber, Mohr, Nickel, Rheoch.

MINERAL OILS: Lux.

MINERALS (POWD.): Klein, Thoulet.

MORPHINE: Grandeau, Husemann, Jorissen, Kieffer, Lamal, Loof, Otto, Pellagri, Robinet, Tattersal, Weppen.

MOUNTING FLUIDS: Beale, Farrant, Godbay, Racini, Ripart, Topping, Wickersheimer.

MYRRH: Bonastre.

NAPHTHALIN: Penzoldt.

NAPHTHOL: Aymonier, Flueckiger, Lustgarten, Richardson, Wolff.

NARCEINE: Arnold.

NATALOIN: Histed.

NICOTIN: Arnold, Roussin.

NITRIC ACID: Braun, Desbassin, Horsley, Lindo, Reichardt, Richmont, Schmidt.

NITROGEN: Donath, Knop.

NITRO-COMPOUNDS: Liebermann.

NITROUS ACID: Denigés, Fresenius, Griess, Griess-Ilosvay, Lindo, Lunge, Meldola, Schaeffer, Wilson.

OILS—FATTY—(The appended letters indicate the following oils: A, arachis oil; C, cottonseed oil; Cac. coconut oil; O, olive oil; R, castor oil; S, sesame oil): Andoynaud, Barbot, O: Basoletto, S.; Baudouin, S.; Becchi, C; Behrens, S; Boudard, Boudet, O; Brullé, C, O; Cailletet, Carlinfanti, S; Crace-Calvert, David, Deiss, C; Di Vetre, R; Finkener, R; Filsinger, Cac; Flueckiger-Behrens, S; Gassend, S; Geitel, Glaessner, Hager, Cac; Hauchecorne C; Hehner, Heydenreich, C; Holde, Huebl, Jacobsen, Koettsdorfer, Labiche, C; Lewin, S; Livache, Lux, Maumene; Merz, Meyer, Millian, S, C; Poutet, Reichert-Meissl, Renard, A; Roth, Royère, Schneider, O; Schoenvogel, Souchere, A; Storch, Tocher, S; Valenta, Vetere, R; Villavecchia, S; Welmann.

OILS, VOLATILE: Dragendorff, Hager, Hehn, Parrot, Puscher, Tuchen.

ORGANIC SUBSTANCES: Lassaigne.

OZONE: Boettger, Houzeau, Wurster, Schoenbein.

PAPER: Dahlmann, Wolesky.

PEPTONE: Posner, Salkowsky.

PHENACETINE: Hirschsohn, Reuter, Ritsert, Schroeder.

PHENOLS: Allen, Bodde, Davy, Eykmann, Fresenius, Hoffmann, Hoppe-Seyler, Jacquemin, Landolt, Lex, Liebermann, Millon, Kintschgen-Gintl, Plugge, Pollaci, Salkowsky, Tommasi.

PHLOROGLUCIN: Weselsky.

PHOSPHOROUS ACID: Pagel.

PHOSPHORUS: Hager, Mitscherlich, Scherer.

PICROTOXIN: Becker, Otto.

PILOCARPIN: Lenz.

PUS: Day, Donné.

QUICKSILVER: Gaglio, Jolles, Merget.

QUININE: Brand, Creuse, DeVrij, Flueckiger, Hesse, Herapath, Kerner, Liebig, Prollius, Schaefer, Vogel.

REAGENT PAPERS: Boas, Geissler, Griess, Houzeau, Musculus, Oliver, Schoenbein, Schoenbein-Pagenstecher, Schott, Stahl, Wurster.

RUM: Karle, Wiederholt.

SACCHARINE: Bornstein, Kayser, Lindo, Schmitt.

SALICIN: Creuse.

SALICYLIC ACID: Millon, Schulz, Spicea.

SODIUM CARBONATE: Biltz.

SOLANIN: Clarus.

SPARTEINE: Marque.

STAINING FLUIDS (Microscopical): Ehrlich, Frey, Gabbet, Gram, Hanstein, Koch, Loeffler, Maugin, Neelsen, Weigert, Ziel.

STRYCHNINE: Fraude, Lyon, Vitali.

SUGAR (cane): Compare with glucose: Basoletto, Conradi, Capezzuoli, Fehling, Fischer, Molisch, Papasogli, Reich, Runge.

SULPHONAL: Ritsert, Schwarz, Vulpius.

SULPHUR: Hager.

TANNIN: Carpené, Gardiner, Gautier, Young.

TEXTILE FIBERS: Persoz, Schlossberger, Schweizer.

THALLIN: Skraup.

THIOPHEN: Meyer.

THIOTOLS: Laubenheimer.

TYROSIN: Hoffmann, Piria.
UREA: Huefner, Musculus, Schiff.
URIC ACID: Dieterich, Fokker, Schiff.
URINE (various abnormal constituents): Ehrlich, Baumann.
VASELINE: Crouzel.
VERATRINE: Luchini, Schumpelitz, Trapp, Weppen.
WATER: Dupasquier, Hager, Mann, Merget, Stahl.
WINE (Coloring Agents): Arata, Boettger, Cazeneuve, Faure, Girard, Nessler, Pradine.
ZINC: Rinnmann.

(Special Correspondence)

PHARMACY IN AUSTRALASIA.

Sydney, May 10, 1897.—The pharmacists in Melbourne, Victoria, are troubled over divers matters just now. Recently they were fighting the grocers and storekeepers about the sale of certain poisons, and now they have to meet charges made by a leading doctor on the

Impurity and Want of Strength of Drugs and Chemicals.

The medico rather makes general assertions than actual statements of facts, and the pharmacists claim that before such general assertions are made to the public, evidence both experimental and otherwise should be complete and unassailable. The author of the charges, Dr. Farmer, says in his pamphlet "that many of the drugs and chemicals must of necessity be impure and useless and that the preparations of the best pharmacies are in many instances unreliable." Why of "necessity?" Surely there are no necessitous reasons for making and keeping impure drugs and chemicals.

In support of his general assertions, the doctor's paper only contains the results of three analyses of one chemical—chlorinated lime. All through he adopts the plan of generalizing instead of giving some data in proof. Thus, "I believe that much of the iodoform in use is adulterated with flour," and again, "I intend being careful in the use of chloroform and ether, to see that I am using reliable articles." He says that the pharmacists' tests for chloroform are crude and unsatisfactory, to which the chemists reply: "If the existing means of detecting impurity be so faulty, how is the absolute purity of chloroform to be determined?" As a matter of fact, an impurity, if it can strictly be called one, is according to the British Pharmacopœia introduced in respect of ethylic alcohol.

This meddlesome medico further states "that the addition of one ounce of carbolic acid to 19 of water, may result in a one or two per cent. solution only if the acid be not pure; the one per cent. solution would indicate that the carbolic acid supplied contained 20 per cent. only of real carbolic acid." In answer to this, the pharmacists say that they would not supply such a specimen to any surgeon. "Such a state of things are (?) disgraceful," continues the doctor, who goes on to deal with opium, quoting Bentley and Redwood's Materia Medica (out of date really) to support his statement that opium contains from 3 to 13 per cent. of morphine. He quite overlooks the fact that the B. P. demands that opium shall contain 9.5 to 10.5 per cent. of morphine. To sum it up: The paper is ungrammatically written, illogical in argument, wholly unconvincing in its conclusions.

Prospects for Pharmacy Legislation.

The Federal Convention has closed what might be termed its first session and the prospects of a United Australia look very healthy. Pharmacists throughout the land are beginning to realize that the time is ripe for combined action, before the convention resumes in September, with a view to asking the convention to include among the laws to be dealt with by the Federal government, the laws relating to pharmacy. What is wanted is a uniform pharmacy act for Australasia. The constitution as drafted leaves to the individual States the control over all branches of government not explicitly handed over to the Federal Parliament. At present pharmacy is left to the States. Supposing the constitution to be adopted by the several Parliaments, there will be only two ways of getting a uniform pharmacy act, (1) by a change in the constitution and (2) by moving the Parliaments of two of the States to take the subject into consideration. We hope before we see the termination of 1898 to be able to shake hands with the people of the United States of America as the unfettered Anglo-Saxons of the United States of Australasia.

Pharmacy Board Changes.

Mr. Henry Brind, the president of the Victorian Pharmacy Board for the last twenty years, has resigned the office. His colleagues gave him an address in the following words: "On the occasion of your retirement from the Pharmacy Board of Victoria, we, your colleagues, beg that you will accept this expression of our regret at the loss of your valued counsel, and of your personal esteem and friendship. Appointed by the government at its inception, on the 6th day of February, 1877, your conscientious and efficient discharge of the duties of the position during your initial term of office, was recognized by Victorian pharmacists by your re-election, and thenceforward until your retirement on the 9th day of February, 1897, a period of twenty years, you have continuously presided over the board. Your judicious counsel has been of rare value to your colleagues in the performance of their important duties, while you have endeared yourself to them by your genial and courteous disposition and by many kindly offices. We heartily trust that your retirement may be blessed with a full measure of health, prosperity and happiness."

The Victorian Pharmacy Act

Compels the board to make an annual report to the government. The report for 1896 shows that 24 examinations have been held, at which 234 candidates presented for the different ordeals. For the preliminary examination, which embraces Latin, English and arithmetic, there were 93 candidates as against 148 in the previous year. The decrease in the number is due to the fact that under Part II of the act, students of the dental profession are not now compelled to pass an educational examination before apprenticeship. For the certificate of the College of Pharmacy, the subjects of examination are chemistry, practical chemistry, materia medica and botany and are both written and oral and 22 examinations were held, at which 59 students toed the mark and 27 passed. For the final qualifying examination there were 25 candidates and 18 passes. The students embraced aspirants from New Zealand, South Australia, Queensland, Tasmania and Victoria.

The College of Pharmacy in Sydney

Is in a bad way. I would be more correct in saying the inchoate college of pharmacy, because it is very small potatoes indeed. The lecturers are three young medical students, who have passed their fourth year's examinations and only require another and final examination to become fully fledged medicos. One of them, Mr. Broinowski, was disliked by the students at his very first lecture 18 months ago, and he does not appear to have improved his relations with the students, who complain of his style of lecturing and indifference to the class. He has frequently absented himself on lecture nights, sending in a written lecture in place of attending. This cannot be tolerated further. The council of the Pharmaceutical Society are to meet this week and discuss the question of the reorganization of the college. First of all they intend calling the students one by one and hearing their complaints and afterwards the lecturers will be summoned before a special meeting.

The absorbing topic of the hour is the movement in Melbourne (Victoria) to form a

Trade Association.

I think readers of the Era will smile a bit when they look over the programme of this pretentious organization. Before I touch it, however, I should tell you that the idea was conceived at a big meeting of Melbourne pharmacists on the 3d of March last, when they met to consider other questions. When "Trade Association" was mentioned by one of the speakers it caught on like a house-a-fire. A sub-committee was there and then appointed to bring up a report. They did so and expressed the opinion that pharmacists were unanimously in favor of forming a co-operative association to be affiliated with the Pharmaceutical Society. They asked that a special meeting of all chemists and druggists be called to consider (1) Shall a trade association or committee be formed? (2) If formed, shall it be an independent organization? and (3) Shall it be affiliated with the Pharmaceutical Society?

Now for the programme. These are the suggestions of the committee; the objects of such trade co-operation: (1) "Acting as a medium for chemists, who wish to combine in purchasing wholesale lots of goods; (2) Acting as a medium for chemists who wish to dispose of surplus stock; (3) Arranging with tea blenders, wholesale chemists, perfumers, cordial makers and others to put up special brands for sale by chemists only; (4) Arranging for the analyses of these special brands; (5) Encouraging chemists to undertake the detection and exposure of adulterations in foods and drugs; (6) Endeavoring to regulate prices, holidays and hours; (7) Establishing a chemists' club, and (8) Arranging a common method of dealing with lodges and dispensaries." It isn't much until you begin to look at it closely, and the more you think it over, the bigger it grows. Three years ago the leading Sydney pharmacists combined in a buyers' association in order to get better terms from the wholesale houses. They attempted nothing more. It appeared to run smoothly for a few months, but when the novelty had worn off, the members found that the game wasn't worth the candle, and that they could not afford the time necessary for carrying it on. The bubble suddenly burst and no one is anxious to take it up again. What would such a gigantic co-operation as contemplated in Melbourne demand of its members' time?

When the Sydney men found it necessary to abandon the buyers' association, they turned their attention to something more practicable; they formed a manufacturing company, and so far they have done very well. They now put up a variety of articles, at a trifle of expense—one member of the company doing all the work at his quiet suburban pharmacy. They are able to push their own goods and successfully compete with all other manufacturers. The same thing has been done by the pharmacists of Western Australia who have boldly launched out with extensive advertisements and particulars of the articles they produce. The Sydney company is quietly feeling its way preparatory to a similar step. Later on they will be able to buy in the open markets of the world and be independent of the wholesale house monopolous trade.

The South Australian pharmacists are endeavoring to move Parliament for a comprehensive

Poisons Act.

Their great disadvantage lies in the fact they did not get a complete schedule years ago. It is very difficult nowadays to induce any Parliament to put certain poisonous mixtures and medicines under the sole control of the pharmacists. The storekeepers cry out that they have always sold chlorodyne, Rough on Rats, Atkinson's Royal Infants' Preservative, acetic acid and other things and being more numerous than the chemists and druggists, they carry more weight with members of Parliament whose only thought is that of securing votes at election times. The South Australians are not likely to get all they want under present circumstances.

L. P. Williams.

L. P. Williams.

Mr. Llewellyn Preston Williams is the new president of the Pharmaceutical Society of New South Wales. He has been on the council for seven years, but all previous efforts to get him into the presidential chair failed. As a progressive pharmacist and popular man he is second to none, and his term of office should be full of interest. He was born in 1856, and educated at Wretham, Devonshire, North Wales. After serving his apprenticeship to pharmacy at Wretham he went to London and studied under Dr. Menter. The year 1876 saw him in Australia, and he settled down in Sydney, establishing what is now a splendid business in the suburb of Waterloo. Two years ago he was a free trade candidate for Parliament, but withdrew before election day at the urgent wishes of the Prime Minister, Mr. G. H. Reid, who had given his support to another candidate before he knew that Mr. Williams was in the field. He is almost certain of being returned to the Legislative Assembly at the next triennial elections.

News.

An unregistered chemist named George Strahan of Newcastle, N. S. Wales, has got himself into a very serious position and is awaiting his trial for manslaughter. A girl of eleven years of age was bathing in the surf and in diving struck the sharp point of a broken oak which was sticking up out of the sand. It penetrated the abdomen and caused a serious wound. Strahan was called to see the girl and he stitched up the wound. Blood poisoning set in and death quickly followed. The autopsy showed that the wound should not have been stitched up until all the pus had been removed. Strahan acted very unwisely in attending the patient, as several doctors were near at hand.

At Wellington, N. Z., a few weeks ago, an unregistered pharmacist attended a woman at confinement, and, by what is alleged to be unskillful treatment, brought about her death. He, too, is being indicted for manslaughter. The two cases will be decided by juries about the same time.

Speaking of juries, suggests Carrol's case in New Zealand. You will remember a paragraph some months back concerning this young chemist. Disappointed in love, he followed the jiltress to Auckland from Bourke, N. S. W., and threw a bottle of sulphuric acid over one Jewell, who was sitting in the parlor of a hotel at Pareoa, near Auckland, with the lady, making final arrangements for approaching the hymeneal altar. Carrol got away from Auckland but was arrested on arrival of the steamer in Sydney and sent back for trial. The jury acquitted him. Here is what the New Zealand Herald says about it: "The town was full of reports as to influences which had tended to produce the verdict. It is said that in the first case there was only one man for an acquittal. The jury on the second trial seem to have got quite dazed by their prolonged sitting, and, the majority of them at least, not to have known what they were doing. They found that the prisoner threw the sulphuric acid. Next they found that Jewell had been injured, but—and here comes in the remarkable feature—they found that 'they were in doubt whether or not he threw the stuff intentionally.' The judge said that was the very question which they had been empanelled to try, and if they had not come to a conclusion on that they had better retire again. That would have necessitated their being locked up all night. The foreman then said that if the verdict as he at first gave it could not be accepted, then the verdict of the jury was 'not guilty.' Was there ever such a muddle?"

An Auckland pharmacist recently tried his hand at importing. He received by registered post from Switzerland 15 ounces of phenazone. It came per the Orient liner, Orotava and was totally ruined by sea water. He now thinks it would have been cheaper to have bought locally, antipyrine at 3s. 6d. per ounce.

A gardener in New Zealand learned from a newspaper that pot. cyanide and acid sulph. was a splendid thing for destroying insects. He poured the acid over the cyanide in a vessel in an enclosed room and, ignorant of the dangerous nature of the prussic acid fumes, remained examining the solution. He was found dead shortly after.

Mr. R. P. Swineford, the representative of F. Stearns & Co., has made the most of his first visit to Brisbane, Queensland, by taking one of the belles of Brisbane. On April 19 he was married to the eldest daughter of Mr. John Greaves, of the Australian Hotel. The ceremony was a sort of a double-barrelled affair. He was twice married, that is, he was first married by the Church of England clergyman and then by the Catholic priest at the residence of the archbishop, the bride being a member of the Roman Catholic Church.

Considerable excitement exists in Tasmania concerning a New Zealand pharmacist named Hatch, who has taken possession of Macquarie Island, near Hobart, and erected a plant for the purpose of boiling down penguins for their oil. He refuses to pay the Tasmanian income tax and is regarded as a bold pirate. An influential body of the Hobart people have waited on the Minister for Lands and asked for the ejection of Mr. Hatch from his Treasure Island. We are awaiting developments.

Quite an important trade in sponges and ginger is being opened up in New Guinea. The finding of gold in Papualand is drawing hundreds of people to that new country. The treachery of the Papuans, however, prevents much progress in any shape.

A pharmacist named Oliver was lost in the snow on Mount Wellington, Hobart, Tasmania, in 1855. A skeleton has just been found and the boots being in a splendid state of preservation, have been identified by the shoemaker, who made them, as those worn by Oliver at the time.

Felton Grimwade & Co., wholesale druggists at Melbourne, have donated $2,500 to the Queen's Memorial Hospital, Melbourne.

The Belladonna plant is poisoning whole herds of cattle in New South Wales. The prolonged drought has left them without grass and the beasts are compelled to eat everything in the shape of plants and scrubs.

The N. S. W. Pharmacy Bill, shelved in the Upper House of the Legislature last session, is to be restored to the business paper and taken up at the point at which it was dropped.

THERMOMETER FOR VERY LOW TEMPERATURES.—Holborn and Wien have invented a thermoelement composed of iron and constantan wire. This latter is an alloy composed of copper containing 40 per cent. of nickel and possesses the peculiarity that its electrical resistance is not influenced by temperature; also next to the bismuth-antimony element it is the most sensitive.

PHARMACY.

TO PREVENT SCALE IN BOILERS.—Kerosene has been recommended to prevent scale in steam boilers, both because of its cheapness and since it leaves no residue and has no injurious effect on the iron. An injector is used so constructed that the amount of kerosene which is fed into the boiler drop by drop can be very closely regulated.—(Eng. and Mining Jr., Pharm. Jour.)

PAINLESS CAUTERIZATION.—As to the pain of cauterization, the editor of the Medical and Surgical Reporter says this is a field where some good work may be done. The only well-authenticated fact as yet presented is a discovery made by Prof. Samuel G. Dixon, of Philadelphia. This is, that cocaine mixed to a creamy consistency with strong nitric acid prevents the pain of its application, while the caustic effect of the acid is unimpaired.

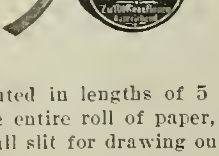
ALUMINUM IMPORTS IN GERMANY.—In 1896 there were imported into Germany 591,500 kilos of crude aluminum. Of these, 467,600 came from Switzerland, 55,000 from France, and 8,400 from Austria. In the first two months of the current year 138,900 kilos were imported, as against 65,900 for the corresponding month of the previous year. The importation of sheet aluminum also is rising, and the customs duties on the metal on the Swiss frontier have consequently been lowered.—(Stahl und Eisen; Sci. Am.)

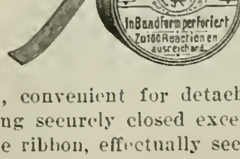
SYNTHESIS OF CITRIC ACID.—This has been accomplished by Trevor Laurence (Jour. Chem. Soc., Pharm. Jr.), by the condensation of ethylic oxalylacetate, with ethylic bromacetate in the presence of zinc. The plastic mass thus obtained was extracted with ether after treatment with dilute sulphuric acid, the ethyl citrate thus removed with other esters, from which it was separated by fractional distillation. From this, citric acid was precipitated as the calcium salt after saponification with alcoholic potash.

PHENETIDINE DERIVATIVES OF VANILLIN, METHYL VANILLIN AND PROTOCATECHUALDEHYDE.—Dr. Goldschmidt (Chem. Ztg.), in view of the fact that the phenetidine derivatives of piperonal possess antineuralgic and hypnotic properties, attempted the same experiment with vanillin, methyl vanillin, etc. Vanillin-para-phenetidine in doses of 1.5 to 2 gm. acted as a hypnotic, standing between sulfonal and lactophenin in activity, no disagreeable symptoms being observed.

Methyl-vanillin-phenetidine possessed hypnotic properties, but to a much lesser degree, because of its lesser degree of solubility. The corresponding compound of protocatechuic aldehyde possesses only slight hypnotic properties.

NEW FORM OF LITMUS PAPER.—The Helfenberger factory, in Dresden, has brought forward a very convenient form of litmus paper in ribbons of 5 meters in length rolled in a lacquered box, the ribbon being perforated in lengths of 5 cm., convenient for detaching. The entire roll of paper, being securely closed except a small slit for drawing out the ribbon, effectually secures it from the influence of outside vapors, etc.





TO PREVENT THE FORMATION OF MOULD IN AQUEOUS PLANT EXTRACTS, Studd (Farmac. Notisblad.) recommends that after allowing the extracts to stand for several days, the fluid be decanted off from the sediment and brought to a boil; then it is again set aside for two days, decanted and filtered through cotton. If the amount of fluid is large, straining is resorted to. For the preservation of solid extracts the same author proposes that first a layer of parchment covered with petrolatum should be placed over the surface of the extract; over this is laid a piece of filter paper moistened with alcohol, the whole finally covered with a layer of parchment, securely tied over the top of the jar.

PORT WINE FROM BARLEY.—When the guileless farmer drops his grains of barley into the cold earth, he has not hitherto been led to expect that after its reaping it will be manipulated and the result vended as the fruit of the grape, and it will doubtless be news to most chemists that port wine can be made from barley. The British Consul at Naples (Con. Rep., Br. and Col. Dr.) says the barley is first malted, "then the bacilli of port wine are introduced into the mead, where they fecundate incontinently, and transform it from immature beer into the richest port. When the animalculæ have done their work they can be sterilized, a sufficient stock of the microbes being preserved in the laboratory for future use.

RARE EARTHS.—"Chemists understand," says The Scientific American, "that the laboratory at Cornell has the investigation of the 'rare earths' quite to itself in America. Yet it is doubtful if it is anywhere known what a mass of these costly elements has been accumulated at that institution. A recent inventory disclosed that of didymium, which sells for $7 an ounce, Cornell has 300 ounces; of cerium, quoted at $6 an ounce, 400 ounces; of lanthanum, worth $35 an ounce, 30 ounces; and considerable quantities of yet rarer 'rare earths' which cannot be obtained upon the market at all. Professor Dennis, of Cornell, has made a life study of these elements, and has notably added to scientific knowledge in this field."

CREOSOTE PHOSPHATE.—This is obtained by the interaction between creosote and phosphoric anhydride in the presence of sodium, yielding a thick, syrupy fluid. This is washed, fractionated, collecting the distillate between 190° and 203° C. The product is a tricreosote phosphate, which contains about 75 per cent. of creosote; it possesses only a slight creosote like odor, and a bitter, astringent taste. This substance is insoluble in water, glycerin, alkalin solutions and oils; it is readily soluble in alcohol and ether. The alcoholic solution upon the addition of water becomes milky.

Creosote phosphate is recommended as a non-toxic substitute for creosote, and it can be given in large continued doses without causing any disturbances usually ascribed to creosote alone.

DETERMINATION OF FREE CAUSTIC ALKALI IN THE PRESENCE OF ALKALI CARBONATES IN SOAPS.—W. Waltke (Chem. Ztg.) recommends that only fresh soap be taken, because in the process of continued drying at 110° C., considerable carbonic acid gas is taken up by the alkali, giving, therefore, too low a result for the free alkali. The small percentage of water present in the fresh soap does not influence the solubility of the alkali carbonates in the alcohol to any appreciable extent. For determining the free alkali the filtered solution of 5 gm. of soap in 75 cc. of absolute alcohol is titrated with N-10 sulphuric acid solution, using phenol-phtalein as indicator. The insoluble residue, which has been well washed with alcohol, is dissolved in water, and the carbonated alkali determined by means of the same standard acid with methyl orange as indicator.

EXPERIMENTS WITH LIQUEFIED AIR.—Dr. Spies calls attention to some interesting experiments with liquefied air, among which are the following: Its conductivity for heat waves was shown by igniting a cigar in the burning point of a sphere filled with liquefied air. Oxygen is more readily liquefied than nitrogen, hence liquefied air contains a lesser proportion of the latter; if the pressure is diminished the fluid boils with a production of a very low temperature, and nitrogen separates therefrom in crystalline flocculæ. As already shown by Pictet, if hydrochloric acid is cooled to a very low temperature, metallic sodium will float about without any reaction, where under ordinary conditions the reaction is very violent. Rubber tubing, when cooled to the temperature of liquefied air, becomes brittle like glass; a bell of lead will give a tone; electrical conductivity is increased five times at this low temperature. Attention is called to the singular fact that all bodies become phosphorescent at a temperature of 200 degrees below 0° C., as for example wood, stearin, woolen goods and all organic substances. A wad of cotton emitted a strong light after first exposing it to the rays of an arc lamp and then suspending in the cooled space.

DRYING SENSITIVE ORGANIC SUBSTANCES.—To determine the moisture in soaps and other sensitive organic substances C. C. Parsons (Jour. Am. Chem. Soc., Pharm. Jour.) uses an oil bath, putting the substance directly into a weighed quantity of hot oil, and weighing again after the moisture has been driven off. It is best to use neutral paraffin oil, without any admixture of animal or vegetable oils or fats, or mineral substances, and with specific gravity 0.920, flash test 435°, fire test 500°, and boiling point about 550°. The object of the high fire test is that the oil should be so freed from volatile matter that none of it will be carried off with the moisture in the substance to be dried. Ordinarily the whole operation may be completed in twenty minutes. It should be conducted in a drying closet kept at 240°. First, the oil is put into an evaporating dish and kept in the drying closet until it has the same temperature, then it is weighed and about one-sixth the quantity of the substance to be dried, weighed and added to it. If very moist, add in successive portions. The whole should be kept in the drying closet for a few minutes after effervescence has ceased. On again weighing, the loss indicates the amount of moisture driven off.

THE LATEST IN COLOR PHOTOGRAPHY.—The most extraordinary process in the reproduction of color by photography is that of Villedieu-Chassagne, which was shown first by Sir Henry Trueman Wood at the Society of Arts. The process is, in brief, as follows: An ordinary print or positive is obtained and coated or painted first with a blue solution, then with a green solution, and finally with a red solution, and the silver image is in some way endowed with the extraordinary power of so picking out the colors that the final result is like nature. The patent specification describes the preparation of those solutions, and after carefully examining it, there is no wonder that M. Dansac, one of the original inventors, died in a lunatic asylum. The blue liquid is composed of about sixteen of the metallic chlorides, even including the insoluble silver chloride, dissolved (sic) in aqueous solution of albumin. Picric, chromic, and oxalic acids and other reducing agents are freely mixed with the chlorides, and so complicated is the whole thing that it would be a good test question for the major examination as to what does happen; and yet, in the face of all this, a company called the "Radiotint" Company, with a capital of £100,000, has been formed to work the process, and the American rights have been sold, it is said, for another £5,000.—Pharm. Jr.

THE LIQUEFACTION OF FLUORINE.—The distinguished chemist, Prof. James Dewar, has just succeeded in liquefying fluorine gas at a temperature of — 185° C. The product was a yellow mobile liquid which had lost chemical activity. Great interest has been felt in the element fluorine since its isolation by M. Moissan, who described it in his celebrated paper in the Annales de Chimie et de Physique for December, 1887. The element exists in a considerable quantity in combination with calcium, forming the mineral fluorspar, which crystallizes in fine cubes of various colors. Fluorine also occurs in small quantity as a constituent of bone and other animal substances. Its intense affinity for metals and for silicon for a long time prevented the attempts to isolate it from being successful. The efforts of the chemists to investigate it in a satisfactory manner were baffled, because its chemical affinities were so numerous and acute that, when driven from one combination it instantly combined with some other substance with which it came in contact. Owing to this difficulty of investigating its qualities, there has been some uncertainty as to its elementary nature. It is probable that Prof. Dewar's discovery will be of great importance, from the fact that the liquefied gas loses its chemical activity. Full details of Prof. Dewar's discovery are at present lacking, but further particulars will be looked for with great interest.—Sci. Am.

MANJAK: A NEW USEFUL MINERAL.—"In the island of Barbadoes, W. I.," says the London Engineer (Lit. Digest) "the discovery was made some months back of large quantities of a certain mineral—locally called 'Manjak'—which bids fair to outrival in point of utility all the similar substances that occur in various parts of the world. Manjak is of a black color possessing high luster, and having a bright conchoidal fracture, in appearance closely resembling newly broken pitch. In Barbadoes it is found very near, and sometimes upon, the surface of the ground in seams varying from 1 foot to 2 feet in thickness, running usually at an angle of about 40° and in close proximity to rocks. It is supposed to have been formed by the drying up and consolidation of petroleum, which occurs in abundance in the same localities, and is often seen oozing out of the ground or floating down the streams. In composition it is not unlike Trinidad pitch, the Utah gilsonite and the Canadian albertite, but is of superior quality to any of these. It is supposed to equal the Egyptian asphaltum in quality, but there is a doubt as to the correctness of this view. . . . Among the various uses to which Manjak has been successfully applied may be mentioned: 1. As insulation for electric wires. 2. As varnishes of the best quality. 3. As bituminous concrete in asphalt roads and pavements. 4. As patent fuel, mixed with peat or other organic matter. 5. In small percentages, as an intensifier of the illuminating power of coal gas. Such satisfactory results have been obtained by its use for insulation that it is expected by some experts that it will soon supplant rubber in all waterproof work."

PERONIN.—Peronin, which was introduced into commerce some time ago by Merck, is the hydrochlorate of the benzyl-ester of morphine, resulting from the replacement of a hydrogen of the phenyl-hydroxyl group of the morphine ($C_{17}H_{18}NO_2OH$)) by the alcohol radical $C_6H_5CH_2$. Peronin, according to the latest clinical authorities, exerts a narcotic action between that of morphine and codeine, being superior to the latter in many respects. Above all, peronin produces a better and more quiet sleep without any exciting symptoms; it is especially recommended in the distressing cough of phthisis and bronchial catarrh; it also exerts a sedative effect in asthmatic, neuralgic and rheumatic pains.

Peronin ($C_{17}H_{18}NO_2$. O. $C_6H_5CH_2HCl$) forms a white crystalline, bulky powder, which is decomposed when heated above 200° C.; soluble at 15° C. to the extent of 7.5 p. in 1,000; further, soluble in 218 p. of alcohol (95 per cent.), insoluble in ether, amyl alcohol and dilute mineral acids. The addition of a few drops of diluted hydrochloric acid to the saturated aqueous solution of peronin will cause the alkaloid to crystallize out in a short time. On adding alkalies to the aqueous solution of peronin, the free base (benzyl morphine) separates as a cheesy like precipitate; the various alkaloidal reagents cause precipitation.

In concentrated sulphuric acid peronin dissolves with evolution of hydrochloric acid vapors to a feebly yellow fluid, which on warming turns a dark red, while morphine and codeine yield colorless solutions under the same conditions. If the cold yellow solution of peronin in sulphuric acid is treated at once with a trace of nitric acid, a dark red-brown colored solution results; under the same circumstances codeine and morphine give a greenish-yellow to violet-black coloration. Peronin with sulphuric acid, which contains a trace of ferric chloride, gives a brownish-red coloration, while codeine gives a blue color.

PRESENCE OF WATER AND OF ALCOHOL IN CHLOROFORM.—Behal and Francois find that most of the chloroform of commerce contains water, so that when the liquid is cooled to a low temperature small crystals of ice adhere to the sides of the containing vessel. The presence of water in a sample of chloroform may be easily detected by first freezing the liquid, and then, after decanting, applying a few crystals of the double iodide of mercury and ammonium to the spots where the crystals have appeared. In the presence of even a trace of water the yellow crystals assume a bright red tint. Alcohol is determined quantitatively in the following manner: Ten cc. of chloroform is washed in a separator, first with 4 cc. of pure sulphuric acid, then with three successive portions of 2 cc. each, so that in all 10 cc. of acid are used. This acid solution is then introduced into a small flask, 40 cc. of water is added, and 20 cc. slowly distilled over in about twenty minutes. Five cc. of this distillate is taken for the determination of the alcohol by the following modification of Nicoloux's method: This quantity of the distillate is introduced into a test tube with 2 cc. of sulphuric acid and placed in a glass water bath, so filled with boiling water that the level of both the liquid in the test tube and the water in the bath is the same. The warmed liquid is then titrated with a standard solution of potassium bichromate containing 16.97 grams of the salt per litre. Two cc. of this solution equals 0.01 cc. of absolute alcohol. This is run in drop by drop until the blue tint at first obtained changes to greenish yellow. One or two drops is sufficient to produce this change when the reaction is complete. The authors apply this method to the testing of commercial samples, and find that they contain from 12.5 to 3.75 volumes per mille of absolute alcohol. —(Jour. de Pharm., Pharm. Jr.)

THE DIGITALIS GLUCOSIDES AND THEIR QUANTITATIVE ESTIMATION.—Of the various glucosides of digitalis recognized by Schmiedeberg, namely Digitoxin, Digitonin and Digitalin, Dr. Keller recognizes only Digitoxin as the active principle. His method of quantitative determination is in outline as follows: 20 gm. of the powdered leaf are moistened with 8 cc. of alcohol and packed in a percolator, which consists of a glass tube 3 cm. in diameter and 16 cm. in length; the lower end of this is drawn out to a (10 cm.) long tube with a capillary tip. The orifice of the percolator opens into a flask of 400 gm. capacity; over the powder a flask containing 300 gm. of alcohol is inverted, and the entire apparatus is allowed to stand about 40 hours, by which time percolation will have ceased. The percolate is evaporated on a bath to 25 cc.; water is added and the whole is washed into a container of 250 gm. capacity, more water being added until the mixture weighs 222 gm. To this fluid 25 gm. of basic acetate of lead solution are added, whereby an abundant precipitation takes place; this precipitate weighs about 7 gm., so that 12 gm. of the fluid correspond to 1 gm. of digitalis. The mixture of fluid and precipitate is filtered, and of this 132 gm. are secured; this is then treated with a solution of 5 gm. of sodium sulphate in 7 gm. of water for removing the excess of lead; after allowing the precipitated lead sulphate to subside, 130 gm. of the clear supernatant fluid are decanted into a separatory funnel, where it is treated with 2 cc. of aqua ammonia (10 per cent.) and shaken out 4 to 5 times with chloroform. The mixed chloroformic extracts are filtered into a tared Erlenmeyer's flask, from which the chloroform is distilled off, leaving the digitoxin as a yellow varnish, which is purified by dissolving in 3 gm. of chloroform and precipitating with a mixture of 7 gm. of ether and 50 gm. of petroleum ether. The solution of digitoxin in hydrochloric acid is yellow; on warming it turns a greenish brown. If digitoxin is dissolved in glacial acetic acid containing some ferric chloride and this solution is carefully poured over some concentrated sulphuric acid, at the line of contact a dark zone forms while the acetic acid solution is stained and intense indigo blue (Keller). With concentrated sulphuric acid digitoxin gives a very dark brown color, finally dissolving with a wine red color.

Digitonin Estimation.—The above aqueous fluid (after having been agitated with chloroform), is acidified with 10 drops of hydrochloric acid and treated with a solution of 0.6 gm. tannin in a little water. The precipitate produced is allowed to subside, then it is filtered off and washed with 10 cc. of water slightly acidulated with hydrochloric acid. The precipitate is dissolved in a menstruum of 15 cc. alcohol and 15 cc. water, then mixed with litharge paste and evaporated to dryness. The dry residue is extracted three or four times with dilute alcohol, which on evaporating to dryness leaves a residue, to which 5 cc. of absolute alcohol are added and on again evaporating, a crystalline varnish-like mass is obtained which dissolves readily in 50 per cent. alcohol. With concentrated sulphuric acid digitonin gives at first a yellow, then a brownish-red color, which finally after solution has taken place, changes to a red. With the above Keller's zone reaction a rose colored zone is obtained.

Digitalin Estimation.—To the filtrate from the digitonin tannin precipitate, 1 gm. of tannin dissolved in a little water is added, followed by three-fourths to four-fifths of the weight of the solution in hydrochloric acid. The precipitate formed is collected, dried on filter paper and transferred to a beaker, where it is dissolved in about 50 gm. of 70 per cent. alcohol. The solution is mixed in a flask with lead carbonate, which has been levigated with diluted alcohol; the mixture is then digested on a water bath until no more carbonic acid gas is given off, and the fluid has but a faint acid reaction. The mixture is filtered, washing the precipitate with dilute alcohol. To the filtrate 5 gm. of finely triturated lead oxide are added, and the mixture evaporated to dryness. The residue is extracted three to four times with absolute alcohol, the alcoholic solutions evaporated in a glass dish to dryness, the residue being purified by resolution in alcohol and again evaporating. The digitalin is obtained as a pale yellow varnish, which is colored yellow with concentrated sulphuric acid; this soon changes to a cherry red. With the Keller's test a bright red zone is obtained.

Keller states that the percentage of digitoxin varies considerably (0.26-0.62 per cent.), this being influenced by climatic conditions.

QUESTION BOX

The object of this department is to furnish our subscribers with reliable and tried formulas and to discuss questions relating to practical pharmacy, prescription work, dispensing difficulties, etc. Requests for information are not acknowledged by mail and ANONYMOUS COMMUNICATIONS RECEIVE NO ATTENTION.

Deodorizing Oil of Turpentine.

(J. T. M.) See this journal, Feb. 18, 1897, page 206.

Insects in Crude Argols.

(F. W. B.) We have under way an examination of the sample of the crude argols you submit. As soon as completed a report of the investigation will appear in these columns.

Sulph. Chinini.

(E. S. E.) The words "sulph. chinini" are a mixture of abbreviated English and German and intended for quinine sulphate. In the German Pharmacopœia the latter is official under the title "Chininum sulfuricum" or "chininsulfat."

Graphite Chain Lubricant.

(F. W.) Considerable information on this subject may be found in this journal, Nov. 7, 1896, page 589; April 9, 1896, page 457, and May 28, 1896, page 683. A standard article of this character is manufactured by the Joseph Dixon Crucible Company, Jersey City, N. J.

Cocaine Muriate and Antipyrine in Liquid Vaseline.

(G. E. B.) was called upon to dispense this mixture:

Oil eucalyptus	1 dram
Oil cassia	40 drops
Oil gaultheria	40 drops
Menthol. crystals	40 grains
Liquid vaseline, enough to make	4 ounces
Cocaine muriate	15 grains
Antipyrine	15 grains

Mix. Use in nebulizer.

He compounded the mixture by rubbing together the cocaine muriate, antipyrine and menthol with the volatile oils, adding the mixture to the liquid vaseline. He obtained a yellowish compound in which the powdered articles were held in suspension. He next strained the mixture, removing a "semi-pasty mass," and now wants to know if he did right in the matter.

Cocaine muriate and antipyrine are insoluble in liquid vaseline, hence no suitable solution for a nebulizer can be made out of the prescription as it reads. By straining, as G. E. B. says he did, these substances were removed from the mixture. By omitting antipyrine and substituting for cocaine muriate a corresponding amount of the alkaloid cocaine in oleic acid, or cocaine oleate, a clear solution may be obtained. Ask the prescriber's permission.

Chloric Acid.

(A. G. K.) According to Roscoe and Schorlemmer, chloric acid is best prepared by decomposing barium chlorate with an equivalent quantity of pure dilute sulphuric acid, thus:—

$$Ba(ClO_3)_2 + H_2SO_4 = BaSO_4 + 2HClO_3.$$

The clear solution of chloric acid must be poured off from the deposited precipitate of barium sulphate, and carefully evaporated in vacuo over strong sulphuric acid. The residue thus prepared contains forty per cent. of pure chloric acid corresponding to the formula $HClO_3 + 7H_2O$. When attempts are made to concentrate the acid beyond this point, the chloric acid undergoes spontaneous decomposition with rapid evolution of chlorine and oxygen gases, and formation of perchloric acid. Chloric acid may also be prepared by decomposing potassium chlorate with hydrofluosilicic acid, H_2SiF_6, when insoluble potassium fluosilicate is precipitated with liberation of chloric acid, thus:

$$2KClO_3 + H_2SiF_6 = 2HClO_3 + K_2SiF_6.$$

The acid solution contains some chlorous acid with an excess of hydrofluosilicic acid. These can be removed by the addition of a little silica and by subsequent evaporation when the fluorine passes away as gaseous tetrafluoride of silicon SiF, and the pure chloric acid can be poured off from the silica, which settles as a powder to the bottom of the vessel. It is then concentrated by evaporation to the desired density, or until it forms a syrupy liquid, over a water bath at a heat not exceeding 100° F. The acid obtained in the greatest state of concentration does not rapidly undergo change at ordinary temperature, but it forms perchloric acid on standing for some time exposed to the light. Organic bodies such as wood or paper decompose the acid at once, and are usually so rapidly oxidized as to take fire. Aqueous chloric acid is colorless, possesses a powerful acid reaction and a pungent smell, and bleaches vegetable colors quickly.

Camphor Cream.

(T. R. C.) The following is a typical formula for "camphor cream":

Castile soap	1½ ounces
Water of ammonia	1½ fl. ounces
Camphor	6 drams
Oil of turpentine	6 fl. drams
Chloride of ammonium	1½ ounces
Water	12 fl. ounces

Dissolve the soap shavings in one-half of the water previously mixed with the ammonia, and the ammonium chloride in the other half. Mix the solutions well and add the camphor dissolved in the turpentine; then agitate briskly until the liquids are united and form a perfect emulsion. Other active medicines may be added when indicated.

The following are sometimes dispensed under the above title:

(1) Camphor	1 ounce
Spirits turpentine	2 ounces
Aqua ammonia	2 ounces
Sweet oil	2 ounces

Dissolve the camphor in the turpentine, and add to the ammonia and sweet oil previously well mixed.

(2) Camphor	3 ounces
Spirits turpentine	4 pints
Soft soap	1 pound
Olive oil	2 pints
Aqua ammonia	1 pint

Dressing for Tan Shoes.

(C. P. C.)

(1) Annato	1 ounce
Gamboge	1 ounce
Acacia	1 ounce
Catechu	2 ounces
Hydrochloric acid	2 ounces
Water, enough to make,	40 ounces

Rub the annatto and gamboge with the acid and a portion of the water, and add this to the remainder of the water with which has been incorporated the catechu and acacia:

(2) Oil of turpentine	3 ounces
Dark yellow wax	1 ounce
Palm oil	1 ounce
Oil of mirbane	15 minims
(3) Yellow wax	6 ounces
Linseed oil	10 ounces
Spirits turpentine	30 ounces

Dissolve in a closed vessel by means of a water bath, and add

Soap	4 ounces

previously dissolved in

Water	2 pints

Stir until cold. With each ounce of the cream thus obtained mix thoroughly.

Nankin brown	5 grains

dissolved in

Rectified spirit	½ dram

The resulting polish is applied to the leather with a rag, allowed to dry, and then lightly polished with a soft cloth.

Some time ago a correspondent in the Drogisten Zeitung gave this formula:

Yellow wax	2 parts
Stearin	1 part
Linseed oil	1 part

Melt together, remove from the fire and add 6 parts of oil of turpentine and 1 part of gold ochre. Keep the mixture warm enough to retain its fluidity. In another vessel melt 1 part of good hard soap in 10 parts of water, and pour the solution little by little, under constant stirring, into the first mixture. Add sufficient water under constant stirring, to make 40 parts. Stir until cold. Fill into wide mouthed bottles.

Ginger Beer Extract.

(F. D.) Here are three formulas:

(1) Ginger root, powder	8 ounces
Slaked lime	½ ounce
Powdered pumice stone	½ ounce
Diluted alcohol, sufficient.	

Rub the first three ingredients together, moisten with diluted alcohol, pack in a percolator, pour on more menstruum, macerate for 24 hours, and then percolate slowly, to obtain 16 fluid ounces of tincture.

(2) Tincture ginger, U. S. P.	8 fl. ounces
Tincture of capsium	1½ fl. drams
Oil of ginger	1 fl. drams
Magnesium carbonate	½ ounce
Water, sufficient.	

Triturate the oil with the magnesium carbonate, and add the tinctures; then incorporate about 7 fluid ounces in divided portions, stirring vigorously meanwhile. Transfer the mixture to a bottle, and allow to stand for seven days, agitating frequently, then filter, and add enough water through the filter to make 16 fluid ounces.

Extract Ginger Ale.

(3) Alcohol	1 pint
Powdered ginger	1 pound
Cayenne pepper	4 ounces

Percolate to 1 pint of extract.

Evaporate, adding 3 or 4 ounces of crushed sugar. Take peel of 1 orange,

Cardamom seeds	2 drams
Oil of lemon	½ ounce
Magnesium carbonate	½ pound

Rub up the orange peel and cardamom with a little sugar. Pour the oil of lemon on the magnesia and rub up, adding slowly 1 quart of water:

For charging 10 gallons:

Above extract	4 ounces
Citric acid solution (1 to 2)	2 ounces
Sugar coloring	¾ ounce
Plain syrup	1 gallon
Water, enough to make	10 gallons

See also this journal, Oct. 15, 1896, page 501.

Photography in Colors.

(H. F. A.) A number of processes have been devised which are said to be able to produce photographs in natural colors, but the greater part of them have never got beyond the experimental stage. One of these, which has received considerable attention recently is the Chassagne process (see this journal, March 18, 1897, page 326.) This process consists in the fact that an ordinary photograph taken on a plate treated with a preparation which is M. Cassagne's secret, after being bathed successively in yellowish-green, blue and red solutions, automatically selects the colors of the objects which are photographed. A blue sky selects the blue and no other color, an apple selects the green and the red, etc. This automatic selection by the print of the proper colors is remarkable, appearing as it does almost that the molecules of the print are endowed with reason to guide them in attracting one color and rejecting all others not possessed by the original in nature. A process which experts say has produced good results for certain kinds of work, is that known as the three-color, half-tone methods of Kurtz, of New York. Kurtz utilized the idea of making three negatives of a subject, one of which photographed only the yellow, or the colors containing the elements of yellow; another print included only the blues, and the third contained only the reds. By this method a painter might take any proportion of red, blue and yellow and mix them into a nondescript tint, and Kurtz, by his three negatives, would analyze and show what proportion of each color was contained in the composite tint. Then a half-tone engraving of each ot the negatives was made, and each of the three colors was printed from its respective half-tone engraving. By carefully super-printing the three engravings results were obtained which were an excellent reproduction of the original picture, though perhaps not quite so strong. Such a Kurtz photograph under a strong microscope showed nothing but a lot of yellow, blue and red dots intermingled with the paper showing through in blotches. Some of the Kurtz effects, notably copies of water colors, were excellent, and, while perhaps not entirely satisfactory to critical color artists, were achievements of a high order. For the printing of color patterns of carpets and dress goods of all kinds the Kurtz photographs were turned to practical use. The drawback against applying the Kurtz method to living objects lay in the long exposure necessary for good results, although this has been reduced considerably of late.

Elixir Lactated Pepsin.

(McL. D. Co.) The National Formulary, revised edition, affords a formula for a preparation containing pepsin with lactic acid. See that work, page 22 (Compound Digestive Elixir). Another formula is the following from Griffith's "Non-Secret Formulas":

Pepsin, pure	80	grains
Pancreatin	40	grains
Diastase of ptyalin	10	grains
Cudbear, powdered,	180	grains
Dilute hydrochloric acid	20	minims
Lactic acid	3	drops
Alcohol	3	fl. ounces
Water	7	fl. ounces
Simple syrup	6	fl. ounces

Mix all the above except the syrup, macerate for three days, agitating frequently; filter, to the filtrate add the syrup, and then through the filtrate add enough of a mixture of alcohol and water, in the proportion of 5 to 7 by measure, to make the liquid measure 16 fluid ounces.

An elixir containing phosphate of iron, quinine and strychnine with lactated pepsin may be prepared as follows:

Phosphate of iron	128	grains
Quinine (alkaloid)	64	grains
Strychnine (alkaloid)	1	grain
Alcohol	2	ounces
Water	1	ounce
Coumpound digestive elixir, N. F. enough to make	16	fl. ounces

Dissolve the alkaloids in the alcohol and add about 12 ounces of compound digestive elixir, then dissolve the phosphate of iron in the water, using heat, if necessary, and add to the previous mixture. Finally add enough elixir to make 1 pint.

Another formula is this one, which, however, contains no phosphate of iron:

Tincture of citro-chloride of iron	2	ounces
Quinine Hydrochlorate	64	grains
Strychnine sulphate	1	grain
Alcohol	½	ounce
Compound digestive elixir, N. F., enough to make	1	pint

Dissolve the alkaloidal salts in 12 fluid ounces of compound digestive elixir, N. F., then add the tincture of citro-chloride of iron and the alcohol, and enough compound digestive elixir to make 1 pint.

Manufacture of Camphor.

(M. McN.) Camphor is obtained from various parts of the camphor tree by distillation with water. The details of the operation vary somewhat in different places, and just what apparatus will be best adapted for your use in Florida can only be determined by actual trial. Most of the world's supply of camphor comes from Japan and Formosa, and the best information concerning the methods in use there may be obtained by consultation of such works as Flückiger and Hanbury's "Pharmacographia," Sawer's "Odorographia," the dispensatories and kindred works. Some years ago, however, the following description of a process employed in Florida was published in this journal. (June 1, 1892, page 328.)

The extraction of the gum is very simple. There is used for the purpose a still consisting of an iron pot holding about five pailfuls, and provided with a wooden cover, into which is fitted a one-inch pipe leading to the condenser. The top of the kettle and cover are plastered with clay to prevent the escape of camphor vapor during the process. From the kettle the pipe turns and runs horizontally into a wooden trough about eight feet long, and then turns down and discharges into a tin can which catches any water condensing in the pipe. To charge the still the cover is removed from the kettle, which is then filled with small limbs and leaves of the camphor tree. A few quarts of water are then added to keep the leaves from burning (they burn very easily). The cover is then fitted on securely and under the kettle is placed a small fire, and the pipe connected with the pipe in the trough, which is kept full of cold water supplied through a hose. As soon as the water produces the least steam, the camphor volatilizes, passing over very rapidly. As it leaves the still it follows along until it comes in contact with the cold portion of the condenser where it condenses and sticks to the inside of the pipe in the shape of fine crude camphor. The condenser pipe is slanted a little so that any water condensed may be delivered into the can. Long before the water reaches boiling point the camphor is nearly all volatilized, but the water is allowed to form a little steam that all the camphor vapor may be driven into the condenser. Every portion of the still must be securely sealed to prevent the escape of the vapor.

To remove the gum from the condenser pipe the pipe is removed from the trough, stood upon end, and struck sharply with a hammer, when the gum will rattle out of the lower end.

Briefly, the following is said to be the process employed in Japan. The roots, smaller branches, etc., of the tree are cut into chips, which are placed, with a little water, in large iron vessels, surmounted by earthen capitals, furnished with a lining of rice straw. A moderate heat is then applied, and the camphor is volatilized by steam and rises into the capital, where it is condensed upon the straw. In Formosa the camphor is prepared from the wood, which is cut into small chips from the trees, by means of a gouge with a long handle. The next operation is to expose the wood to the vapor of boiling water, and to collect the camphor which volatilizes with the steam. For this purpose stills are constructed, which are thus described (Pharmacographia): A long wooden trough, frequently a hollowed trunk, is fixed over a furnace and protected by a coating of clay. Water is poured into it, and a board perforated with numerous small holes is luted over it. Above these holes the chips are placed and covered with earthen pots. A fire having been lighted in the furnace, the water becomes heated, and the steam passing through the chips, carries with it the camphor, which condenses in minute white crystals in the upper part of the pots. From these it is scraped out every few days, and is then very pure and clean. Other stills have been described where a stream of water is made to come in contact with the condensing apparatus. After sublimation the camphor placed in vats having holes in the bottom, which allows the yellowish oil of camphor to drain away. In some places pressure is employed to effect the removal of the oil.

The crude granular camphor is next refined and prepared for the market, an industry which obtains to some considerable magnitude in Philadelphia. This process, together with the apparatus employed, is quite fully described on pages 171 and 878 in Remington's "Practice of Pharmacy," last edition.

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[*WEEKLY.*]

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ERA COURSE IN PHARMACY.

Some preliminary announcements and instructions for pupils who intend to join the regular classes of the ERA COURSE IN PHARMACY will be found on page 5 of this issue.

All drug clerks and druggists who intend to matriculate for this Home Study Course in Pharmacy should see that their applications are filed as soon as possible, so as to receive all the preliminary instructions to be printed in our July and August issues. The regular lectures begin with the first issue in September.

THE COMPLETE PROSPECTUS is now ready and will be sent upon request.

Address, THE PHARMACEUTICAL ERA,
P. O. Box 1483, New York.

Index to Volume XVII.

Accompanying this number is a comprehensive index to Volume XVII, January to June, 1897, inclusive. This half yearly volume contains a total of 772 pages of regular reading matter, exclusive of the large amount of more ephermeral material presented in the Trade Department. The volume embraces 25 numbers of the Era (not 26, as usual), but during the second half of the year subscribers will receive 27, thus making the usual year's total of 52. The index serves well to show the wide range and variety of subjects treated in these pages, and how thoroughly the druggist's manifold wants are appreciated and catered to. Special effort has been exerted to make these index titles indicate the general substance of the articles and paragraphs to which they refer in every case where the printed caption is not sufficient to serve thus. It is not only an index of headings, but of subjects, in many instances a single article furnishing a number of index references. The importance of such an index is apparent, and subscribers are reminded to look for it in this number and preserve it for binding with their copies of the journal.

Liquors in the Pharmacopœia.

At the recent Philadelphia meeting of the American Medical Association, before the section on Materia Medica, Pharmacy and Therapeutics, there came up for discussion a question which was agitated at last year's meeting of the American Pharmaceutical Association at Montreal. It was the question of the advisability of dismissing from the Pharmacopœia all fermented and distilled liquors recognized as beverages. Dr. N. S. Davis, the founder of the American Medical Association, precipitated the discussion by reading a paper in which he argued that these articles should not be retained in this official work. Wines, brandies, whiskies, etc., vary greatly with regard to strength, purity, flavor and other characteristics, and U. S. P. tests are not and cannot be competent to decide upon their merits. These tests will neither exclude the bad nor set a standard for the good. If the therapeutic effect sought is that of the alcohol only, why not use alcohol simply, of a strength easily attained as prescribed. It can be accurately diluted to any strength desired. If virtue be attributed to any other constituent than alcohol, the compound ethers for instance, the argument has little weight, for both quantity and character of these are very variable and the U. S. P. can regulate neither. As nutrients, the speaker argued that a whole barrel of wine was less valuable than a single small loaf of bread. He characterized the whole medical prescription of liquors as unscientific, unprogressive, inexact, claiming that alcohol could be better employed for all the uses to which wines, brandies and whiskies are now put, and discarding these articles from the Pharmacopœia and from the druggist's shelves would do much to remove from the profession of pharmacy the reproach so often cast upon it, that its members are but dram sellers.

There was considerable argument in opposition to the opinions thus expressed, but most of it was very trivial, none of the reasons given in favor of retaining these articles being such as could not easily be controverted. Medicinal wines (so called) can be made with alcohol just as satisfactorily as, even better than, with wines whose composition no one under the sun can accurately estimate. Dr. Davis' position would seem, in all common sense, fully justified by the facts known in regard to the nature of the wines and liquors handled by the drug trade. They are indeed fearfully and wonderfully made and no man knoweth whence they come nor whither they go.

Medicine can, possibly, never be an exact science, but it can get a little nearer exactness in the direction pointed out by Dr. Davis, and if his suggestions are carried out it will be a good thing for the fair fame of the druggists. No more vexatious and degrading government and local excise licenses, no more competition with the corner saloon.

Animal Extracts with a Vengeance.

To the man up a tree it seems that the theory of disease treatment by means of animal extracts bids fair to afford a striking example of science gone mad. We have extracts of this, that and the other organs of the body (taken from sheep and other dumb brutes) for the cure of ailments of the corresponding organs in the human structure. This new science comes perilously near to that old and much despised hanger-on of homeopathy, treatment by nosodes, morbific products, a most disgusting therapy. Brown-Sequard with his rejuvenator of marvelous efficacy started the scramble, and now all are trying to discover some new organ or some new disease to give excuse for a new animal extract. We have extracts of the brain, heart, and other mentionable and unmentionable constituent parts of the human economy, but here's a new one, a lung extract, though goodness knows whether it is intended to repair the damages from the tubercle bacillus' lusty depredations or to increase the shouting capacity of the brood of exploiters of this modern class of medicaments. At any rate, it is fathered by one Brunert, who tells us to take fresh lung tissue, shaved thin (though how and from whom or what we are to take it is mercifully kept from us), soak it awhile in glycerin, add some sterilized water, filter it through linen (linen, mind you), sterilize it and "pass it through a Chamberlain (?) bougie and glass tube into the ball in which it is kept ready for use," and there you are. Has this "eminent scientist" ever been made acquainted with the merits of the extract of brain?

A Sample Tariff Argument.

The Pacific Medical Journal has been disseminating the following information:

> "It is reported that certain manufacturers are making an attempt to have a duty put on quinine. At the present time it is about 50 cents per ounce. Before the duty was removed it sold for $4 to $5 per ounce. We hope that every medical journal in the country will instruct the Representatives for their district to retain it on the free list. Quinine has become almost an absolute necessity to the American people. It would be rank injustice to again place a duty upon it."

The drug trade would be very glad to sell quinine at 50 cents an ounce. This may be done on small lots, but quantity prices are below 20 cents. But the argument that a duty ever has influenced or would materially affect the retail price of this article has repeatedly been shown to be fallacious. When quinine was four or five dollars an ounce this price was due, not to any duty, but to limited production. The cultivation of cinchona bark during twenty years back has progressively lowered the price of the alkaloid, and this too despite the fact that the duty assessed has several times been increased. The proposed small duty is asked as a protection to the domestic manufacturer; it would little affect the consumer who purchases a dozen powders or pills.

Ram's Horn.

Department Stores.

"What are you going to do about it?" fairly well represents the attitude of the department store toward those who object to its existence and its methods, and truly no very satisfactory answer is forthcoming. Legislating against it has been tried, but it doesn't work, and probably cannot be made to work, for the department store has a legal right to life. The question has been discussed pro and con till the disputants are black in the face, and still the greatest trade evil of the day is hale and hearty. It would seem, when all is said and done, that the only solution is to effect the reform as all great reforms are brought about, by the force of public sentiment. This requires a campaign of information, of education.

We cannot drive out the department stores by abusing them, we cannot get legislation to stop them, we must tell the people what they are and what they do, and the evil effect they have on every business. And perhaps we must copy some of their good traits, for they possess such. Such a campaign is under way in Canada, some 200 papers being reported as having taken up the question.

Here is one of the good traits alluded to above:

> "The credit system has ruined many a shop keeper, and the fact that they deal for cash is one of the undeniable features the defenders of department stores are able to urge in their favor. . . .One way of contending against the department store is for the smaller retailer to adopt their methods of 'system, economy, cash-buying and cash-selling, care and taste.' But let them avoid humbugging their customers with cheap pretenses and false bargains, for these are among the weak points of the department stores, and such weaknesses cannot last."

One of the papers describes the frauds and tricks practiced by the department stores.

> Spools of silk: The wood bulging in the center. There is hardly any silk on them. Garden and flower seeds: Packed specially for the department stores. "Marked down" to twenty-five cents, the package contains only as much as could be bought for twelve cents at a small store. Seidlitz powders: Made of alum and other ingredients not used in real Seidlitz powders. Citrate of magnesia, offered at a bargain for 40 cents a pound. Composed almost entirely of white sugar, will not fizz, and is worth about 5 cents a pound. Blood purifier, sold for 35 cents a bottle: worth 5 cents a gallon. Berlin wool: 16 skeins weigh only 12 ounces, instead of a pound. Wall paper, "worth $1 the piece": Found to be out-of-date paper that never sold for more than 50 cents at the regular dealers. "Our special gold watches, sold at the low price of $39.40": Regular jewelers never charged more than $31.50 for them. Tea, sold for 25 cents a pound, advertised as "worth 40 cents": Can be had at any retailer's for 10 or 12 cents, if he keeps such poor stuff in stock. "Forty-two-inch diagonal twill serge, regular price 25 cents. Friday, 15 cents": Sold for 10 cents in a straight dry goods store.

Now, suppose our own papers should tell the people of all such practices (if found true), would it not eventually and not far in the future, have the desired effect?

From The Shoulder.

There was so much hard horse sense in a paper read by C. E. Corcoran at the recent meeting of the Missouri Pharmaceutical Association that it should have as widespread circulation as possible. The paragraphs are terse, crisp and to the point. The writer evidently goes on the principle of hitting a head when he sees it, and has a faculty for getting at the real root of things. No apology is necessary for emphasizing his remarks by selecting and publishing some of the best of them in this department.

Cutting of prices in smaller towns and cities can be avoided by unanimous consent of the druggists; but the way to hinder it in large cities has yet to be discovered.

The concentration of business in large business concerns in the downtown parts of the large cities is caused mainly by rapid transit and elevators.

The selling of all kinds of merchandise at almost cost is caused chiefly by the insane desire to sell cheaper than the other fellow. This also causes manufacturers and large dealers to employ their employés at starvation wages.

The patent medicine maker can protect the retailer against the cutter, if he will. If he does not, he should not complain at substitution.

The makers of semi-proprietaries can afford to sell us their goods in bulk at less than half the price they do now, and unless they conclude to do so, they should not complain at imitation and substitution. As it is now, when we fill prescriptions for people, out of their four, eight, ten, twelve, fourteen or sixteen-ounce bottles, we are robbing our patrons, and filling the pockets of said semi-proprietary makers with ill-earned money.

Physicians should not prescribe semi-proprietaries, unless the makers of them consent to furnish them in bulk to the retailers at reasonable prices.

If the physicians carry around with them granules, tablet triturates, etc., and dispense them to their patients, they should not complain about "counter-prescribing."

What with the semi-proprietaries and the physicians who prescribe them, the druggist seems to be "between the devil and the deep sea."

I think that the druggists are not so dishonest as some pharmaceutical and medical journals, doctors and semi-proprietary makers would fain make them out to be.

Cannot something be done to induce wholesale and retail druggists to refrain from handling certain disreputable goods?

It would seem as if the State Board of Pharmacy might as well throw up the sponge and quit business, in view of the fact that the State is full of unregistered proprietors and clerks, doing business right along. The law is such that the board cannot prevent it.

We Should Guard Against Getting into the Drug Rut. We ought to know a good deal more than the drug business. We have a right, and it is our duty, to be generally intelligent upon all subjects. The druggist possessed of general knowledge, will be the best and most successful one.

We cannot afford to be radically positive in this life, because we find to-day that in believing what we did yesterday, we were mistaken.

Our governmental principles and social laws are such that the druggist can be a man among men, and such he should be.

If the druggists would learn to be better friends to one another, more intimate with, more kind to and less suspicious of each other, they would be much happier, have fewer troubles, and be more successful than they are.

We should always remember that other people very often do not see things as we do, and should govern ourselves accordingly.

No one has a better chance to exert an influence for great good in his community than the druggist. His opportunities in that direction are manifold. It is his duty to remind himself of this fact very often.

The golden rule is a good one for the druggist as well as for every one else.

Physicians, when they prescribe teaspoonful or drop doses, should instruct their patients to provide themselves with graduated medicine glasses and dropping tubes, otherwise the patient is liable to get from one-half to two drachms at a dose. We druggists should often remind the doctors of this fact.

Will some one give us a good and valid reason why we should furnish doctors with prescription blanks?

Let the druggist so live that when his task is done, he can lie down to that last long rest, feeling that he has done his duty well, and without any fear as to what may be beyond the grave.

"Drumming up Business for You."

To stimulate our advertisers to put forward their best efforts and to encourage the drug buyers with liberal propositions, we have, as explained on advertising page 19, agreed to refund our charge to the advertiser who secures the largest number of replies from his advertisements in the Era during July and August.

We hope that our friends and subscribers will co-operate with us to make this competition a success, the object of which is to stimulate business, and if we all make a determined effort for more business it is sure to bring better business in the drug line.

Please remember that in writing to an advertiser you should always mention the Era, in order that he may give proper credit to your inquiry.

"That scheme of the Era's to pull out good advertising offers for the retail druggists is a good thing and I shall keep pushing it along."

The Missouri Pharmaceutical Association did a good thing the other day in officially adopting the metric system of weights and measures. The resolutions covering this action were presented last week in our news report of the meeting. This action is the more significant in that it was in direct opposition to the opinion of the association's president, expressed in his annual address. He asserted that it was in the interest of simplicity to retain the old, cumbersome apothecaries' system, a most remarkable plea indeed, for what system is simpler than the metric, and what more irregular and illogical than the apothecaries'? The charge that the metric system is un-American is even more ridiculous. This system has no nationality, but is the chosen language for the expression of weight and measure by scientists of the entire world. It is its simplicity and general applicability which constitute its chief recommendations. We hope the example set by Missouri will be generally followed.

SURGICAL ANTISEPTIC.—A mixture of equal parts of calomel and iodoform has been found to be an excellent surgical antiseptic.

Correspondence.

We are pleased to publish here communications from our readers on topics of interest to the drug trade. Writers are requested to express their views as briefly as possible. Each article must be signed by its writer, but his name will not be published if so requested.

Reprints of Substitution Articles.

Jersey City, N. J., June 21, 1897.

To the Editor: I am very much pleased with the articles published in the Era on the Substitution Question. They seem to meet my views completely, but, of course, through a trade journal they do not reach the public at large, where they would do much good in educating the people up to the truth of this great bugaboo—Substitution—that is being so much flaunted before their eyes by the advertisers of nostrums.

The thought has occurred to me why the most appropriate of these could not be printed in large quantities and furnished to the druggists at a moderate cost with their imprint on, to be used by them either as circulars or as counter wrappers, thus giving them a chance to do the most good. Yours respectfully,

JAMES FOULKE.

We shall be pleased to carry out our correspondent's suggestion and furnish reprints of any article desired at the actual cost of production.—[Ed.]

Reply to Mr. Meyer.

Benton Harbor, Mich., June 23, 1897.

To the Editor.

In one of the May issues of the Pharmaceutical Era I saw an article written by C. F. G. Meyer against the substituting of proprietary medicines by the retail drug trade.

He seems to think it wrong for a druggist to try to sell an article of his own production.

Why should it be? Every one has to get a start and I do not think it any greater sin for the druggist to buck the manufacturers of patents who allow their medicines to be sold at cut rates than for one wholesaler to try to get the trade from another in the same line.

As regards quackery, where did the formulas for the majority of patents come from—the fertile brain of some eminent physician or from some old lady or gentleman who, with a most knowing look and in confidence, will tell you that it's the best thing you ever saw for (whatever it may be). As far as the responsibility is concerned, I hold that the average druggist is as capable of assuming it and putting a remedy on the market with his recommendation as almost any manufacturer of patents.

Some of them I am personally acquainted with and they hardly know aloes from ammonia.

Yet according to Mr. Meyer they are responsible. I am a disinterested party in this matter, as I do not manufacture any substitute and there is no cutting done here.

There is a remedy for the manufacturer to stop cutting if he wants to apply it, that will insure him the efforts of the drug trade.

I question, however, their sincerity in desiring to stop it, as having a remedy sold by large department stores acts as a two-edged knife in this way, they buy heavy and it's an ad. in the bargain. Respectfully,

F. S. HOPKINS.

American Drug Preparations in France.

Inquiries having been made at this Consulate (U. S. Consulate at Limoges) by some of the leading druggists of central France concerning certain American preparations of drugs, a few samples were shown to them, and they expressed themselves satisfied and well pleased with what they termed "a triumph of American progress." It seemed to these gentlemen that an excellent opportunity for the introduction of large quantities of these goods from the United States presents itself.

Medical science has made wonderful progress in France, and it is true that there are no greater savants in the medical and pharmaceutical professions than some of the French physicians and pharmacists; but outside of Paris, except in one or two of the principal towns, there has been little or no progress made in the preparation of remedies. Quinine and similar powders are given in old-fashioned capsules made by hand; these are larger than an American cent, and are difficult for children and certain invalids to swallow; besides, the process of making them is long and tedious, and the dose is not regular, because every capsule is not weighed in the course of its preparation.

Many of the new remedies, although they are well known and appreciated by physicians, fail to become popular because of the difficulty in preparing them. The provincial druggists are often unable to procure these drugs except in a crude or unprepared state. The French laws regulating the sale of liquid poisons are exceedingly strict, and the danger of taking an overdose prevents many persons from using these remedies unless prescribed by a doctor. No physician can prepare his own prescriptions if there is a pharmacy in the town. A pharmacist must hold a diploma from a Government faculty in order to make up prescriptions. An exception to this rule is made in communes having no drug store within a radius of 6 kilometers (about four miles) of the patient's residence. As the number of houses outside this regulated distance is very large, it is often embarrassing to the physician, and the delay in going so far is frequently dangerous to the invalid. To obviate this delay, the physician carries a few drugs in general use with him, but owing to their volume and the difficulty of arranging them conveniently in a portable case, the doctor frequently lacks the medicine required to relieve the patient.

To aid this class of physicians and invalids and to see what could be done, samples of American compressed tablets have been shown to a few druggists and doctors, who immediately conceded that these preparations were put up in the most compact and convenient manner possible, and that such goods were much needed in France, because a larger variety of remedies could be carried and no time would be lost in making up prescriptions nor would there be any risk of overdosing.

The following list of drugs are those most usually prescribed in this country: Sulphate of quinine, opium, nux vomica, Dover's powder, lithia, chlorate of potash, bromide of potash, bromide of sodium, salicylate of soda, iodide of potash, and others that enter into the daily use of a physician having a general practice. Rectal and vaginal suppositories of nearly every description are also much employed.

The drought of 1893 lessened the number of cattle all over Europe, and since then, sugar of milk is very high in price. This commodity could be advantageously exported to France.

A certain quantity of proprietary medicines might find a ready sale if put upon the market in a wise manner, but it will be absolutely necessary to have the formulas printed on every bottle. Such common preparations as seidlitz powders and citrate of magnesia, and heavy drugs like glycerin, borax, potash, cod liver oil, borate of soda, caustic soda, and alkalies are used in large quantities in this country.

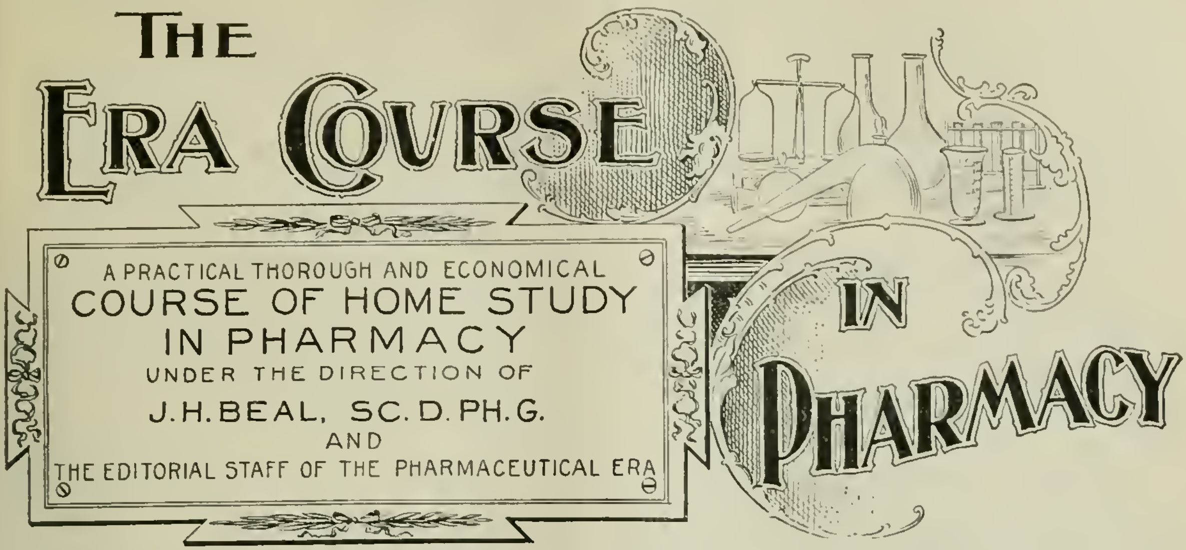
Mineral paint, adapted for iron work, is largely used.

The French druggists have been deterred from using American drug preparations because the weights and measures employed by the exporters from the United States are not the same as those in use in France; the decimal system is the only one known here—grains, drachms, and ounces are unknown quantities to the laity, and the profession will not take the trouble to translate the weights into grams and milligrams, so as to find out what doses to give. The French admit that the manner of putting up drugs in the United States is greatly superior to that of other countries, but the system of foreign weights, measures, and currency forms a barrier to their introduction into this Republic.

All drugs should be put in neat, but not too large, packages; the matter of color and taste are important items to take into consideration, because the masses are not accustomed to taking medicine without a doctor's prescription, as are the people of the United States.

If a general depot of American drug preparations were established in Paris where the articles could be seen and examined, it would greatly aid in the introduction of goods.

A large wholesale druggist remarked to the writer recently that "the only thing lacking to make the enterprise successful was the initial step to bring American drug preparations into the European markets."—Walter T. Griffin, in U. S. Consular Report.



THE ERA COURSE IN PHARMACY

A PRACTICAL THOROUGH AND ECONOMICAL
COURSE OF HOME STUDY
IN PHARMACY
UNDER THE DIRECTION OF
J. H. BEAL, SC. D. PH. G.
AND
THE EDITORIAL STAFF OF THE PHARMACEUTICAL ERA

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* * *

ANNOUNCEMENT.

The lectures of the Era Course in Pharmacy will begin with the first issue of the Pharmaceutical Era in September. In conducting the recitations, the questions will be sent out each week in the order of the matriculations, so that those who stand earliest on the record will be the first to receive their recitation blanks. This will give to such students the advantage of a longer time in which to prepare their recitations before receiving the next lecture.

For these reasons intending students should take out their matriculation cards as soon as possible, so as to have all the preliminary blanks at hand and to be ready to begin work promptly with the appearance of the first lecture.

TEXT BOOKS.

It is not advised or intended that the student should provide himself with an expensive list at the beginning of his course of study. Books had better be purchased as needed, and as the student becomes better acquainted with his work.

The list of books given in the prospectus is merely to aid the student in making a choice. Should he find it difficult to decide the question for himself, the publishers of the course will be glad to aid him in making such a selection as will best serve his needs at the smallest expense.

QUESTIONS ANSWERED.

The publishers of the Era Course will be glad to answer questions addressed to them upon all matters about which intending matriculants may find themselves in doubt.

KEEPING UP WITH THE LECTURES.

One of the most important elements of success in pursuing this or any similar course of study is to keep pace with the regular exercises. A prime advantage of such a course over self directed study is in the system and regularity which it enables the student to bring to his work. Much of this advantage will be lost by the frequent skipping of lectures or recitations.

Occasionally, however, a student may unavoidably be compelled to make a break in his studies. In such a case the question may arise whether he should continue with the advanced work, or first make up the lectures in arrears. The answer to this question will depend somewhat upon the particular circumstances. Where the subject is so connected that a knowledge of what has preceded is essential to the understanding of what is to follow it is, of course, necessary to first make up the preliminary work. Generally, however, the student will find it advantageous to prepare the later lectures first and then bestow any remaining time he may have upon making up arrearages.

FORM LOCAL CLASSES.

In localities where two or more students take the work, they would find it very advantageous to form themselves into classes to meet regularly for the study of the lectures and to hold their own quizzes and examinations. In this way enthusiasm is sustained and a more thorough mastery of the work accomplished.

FOREIGN RATES.—In reply to numerous inquiries we would state that the Era Course will be found particularly adapted to the wants of students in England and other foreign countries. The cost (increased because of the greater postage) to such students will be:

One year's subscription to Era........	$4.00
Class fees (two terms) one year	6.00

Making a total of $10 per year for the full course.

REQUIREMENTS FOR MATRICULATION.—The only requirements are that each student shall be a subscriber to the Era in his own name and his subscription paid in advance for one year; in addition to this there is a tuition fee of $4.00 per annum, payable in advance. This makes a total expense of only $7.00 for forty weeks of systematic instruction, including quizzes and examinations by mail. The price is so low that our friends will please not ask us to make any exceptions to these requirements or terms.

◆

Secretaries of Boards Indorse the Course.

I. A. Keith, Lake Preston, S. D., secretary of the South Dakota Board of Pharmacy, has carefully examined the prospectus and outline of curriculum of the Era Course in Pharmacy, and he writes that he is "convinced it will be of lasting and permanent benefit to all who pursue it. The expense is so nominal that no person engaged in the business can afford to let it pass without taking it in; especially is this true of practical men, clerks, or proprietors, who have not had the benefit of a college course in pharmacy. I shall look forward with pleasing anticipation to the time for the opening of the course."

* * * *

H. F. Pfost, Jackson, W. Va., secretary of the West Virginia Board of Pharmacy: "I heartily commend the Era Course in Pharmacy. In fact, I have always favored any and all things that had for their object the advancement of our profession. The course will be of incalculable benefit to any druggist, and especially to those assistants in stores who are unable to attend college."

* * *

H. M. Bishop, New Haven, Conn.—I have carefully examined the Prospectus of the Era Course in Pharmacy, and I think it an excellent one. The price brings it within the reach of all, and to those who are looking forward to an examination before a board of pharmacy, it would seem to be almost indispensable. It must also, as you say, be of much practical importance to those who are already proprietors. I wish you success, and shall take pleasure in advising such course.

* * *

W. S. Parker, Lisbon, N. D.—I have carefully examined the outline of the proposed "Era Course." I am of the opinion that this course of instruction affords a means by which all can, if so disposed, acquire a thorough knowledge of the practice of pharmacy. I heartily recommend this course to all students whether they intend to take a college course or not.

* * *

R. L. Lynch, Phar. D., M. D., Washington, D. C.—I heartily indorse the proposed Era Course in Pharmacy. Many prospective applicants for examination before the District of Columbia Board of Pharmacy have come to me with the request that I furnish them with a list of text books, the study of which might make them reasonably certain of passing the examination. The Era Course would undoubtedly be just the thing, and I would suggest that it is the duty of every pharmacist to furnish his store library with the lectures, if he is at all interested in the apprentice whom he employs at phenomenally low wages, with the avowed purpose of teaching him the drug business.

* * *

E. B. Heimstreet, Janesville, Wis.—I am fully in sympathy with this move of yours, and think it will be of great benefit, not only to many of the young men who are preparing for their examination, but we, the older pharmacists, can gather a good deal of information. I trust you will meet with success in this project.

Opinion of A Ph. A. President.

J. E. Morrison, Montreal, Canada.—Your plan is excellent, and to use a hackneyed expression, "will fill a long-felt want." I have been carrying out a similar scheme for the last year in connection with our journal, and I believe it has been of value as very many clerks who could not attend lectures have taken advantage of it. Your paper being a weekly can of course go into it more extensively and thoroughly, and with Prof. Beal in charge of the work there is no doubt of its success.

CURIOSITIES OF THE CALENDAR.—Even our erratic friend the calendar has a few rules and regulations which are as firm as the laws of the Medes and Persians. One is that no century can begin on a Wednesday, Friday or Sunday. Another is that October commences always on the same day of the week as January, April on the same day as July, and December on the same day as September. February, March and November also begin on the same day. June and August alone do not consent to be matched in this manner. These rules do not hold good in leap years. The ordinary year always begins and ends on the same day of the week. And those who are of a frugal mind may be glad to know that the calendar repeats itself every twenty-eight years; so that if any one preserves the calendar of 1896, he will be able to use it again in the year of grace 1924.—Scottish Typographical Circular.

A writer in the Louisville Journal has discovered that the more enterprising soda fountain druggist now has a regular saloon license and employs a competent barkeeper. This is commended from the Kentucky point of view as follows:

"To the uninitiated this custom seems a little broad, but upon second thought commends itself, as the drug stores do not supply places for continuous drinking. The proprietors are there to give you what you want for medicinal or thirst-quenching purposes, and then they expect you to leave in a quiet and orderly manner. It is not necessary to wink or to ask for cold tea or use any of the many other subtle phrases which are known to men and their friend behind the counter, for the drug stores that have licenses are privileged to sell anything that the thirst or longing of man requires without deceit of any kind."

A Receipt for Scornful Beauty.

Here is a formula taken out of an old Scotch private receipt book (John Phillips, Dundee, Scotland, 1805), and sent in by H. L. Scherb, Los Angeles, Cal.:

Lover—
Doctor, whose medicines can erase
The lurking seeds of each disease,
From fair Lucinda can your art
Purge too of cruelty her heart?
Doctor—
Take first of complaisance
The genuine sort we import from France,
One ounce, of correspondence four,
And lovers' vows as many more;
Six drachms of friendship is enough,
Dissolved in well feigned tears, quant. suff.
To these you need not add above
Two, or, at most, three grains of love;
A drug we seldom now prescribe,
With which assurance mix ad lib.
In sweet, good nature these infuse,
And when occasion offers, use.
But if the piquant humor yet
Remains—you must the dose repeat.

(*Concluded from page 750, June 24.*)

THE BUBONIC PLAGUE.*

BY VICTOR C. VAUGHAN.

Professor of Hygiene in the University of Michigan.

I will now consider some of the characteristic symptoms of the disease. It is undoubtedly a septicemia, or form of blood-poisoning. As has been stated, the bacillus is found in the blood and in all the organs. It is customary to describe the disease under two forms. The milder epidemics are known under the name of pestis minor. In this form the glands of the groins and armpits swell and either suppurate or undergo resolution. There is moderate fever, although in exceptional cases the temperature may reach 104° F. The disease usually continues from ten to twenty days, and may last for from four to eight weeks. Pestis minor sometimes precedes and at other times follows the more severe forms of the disease. The former was the case in the epidemics in Mesopotamia in 1873 to 1878, and in Astrakhan in 1878.

Foderé, as quoted by Cantline, makes the following statement concerning pestis minor: "In the Levant and in the Marseilles epidemics of 1820, cases were to be seen which were not ushered in by any alarming symptoms, and where the natural functions were undisturbed, and where buboes and carbuncles appeared without fever, or only with slight fever, or the buboes went on to a healthy suppuration more or less prompt, or even disappeared and went on to resolution without the help of art, without any inconvenience, and with a perfect integrity of all the functions. This state is comparable to benign smallpox, during which children play together and walk in the streets without any precautions, no care being taken of their treatment, and yet terminating favorably. It is the benign plague of authors, which is observed when the disease commences and when it is at its end, though it is rarely seen in the middle period, which is entirely devastating, but it is not less plague, and it no less merits the attention of physicians and magistrates."

In pestis major there is a prodromal stage, accompanied by aching in the limbs, shivering and a high degree of nervousness. The patient seems to be unable to quickly comprehend questions. There is a staggering gait similar to that of alcoholic intoxication. There is intense headache, with thirst and great pain in the epigastrium. The eyes become red; the tongue dry, swollen, fissured, and sometimes black, and at other times covered with a thick white coat. Coma may set in and death result before there is any marked elevation of temperature. In some cases, however, the temperature may reach 107° F. during the twenty-four hours preceding death.

In cases less rapidly fatal there are glandular swellings. These occur in the groin in about 50 per cent. of cases, in the armpits in about 35 per cent., and less frequently in the neck and other localities. One peculiarity of the graver form of the disease is the occurrence of stablike pains in various portions of the body. This symptom gives rise to the superstition among the ignorant that the victim is wounded by invisible arrows shot from the bow of some demon. Suppuration of the buboes with free discharge has been regarded as a favorable symptom. The skin is sometimes covered with livid petechiæ, which become very dark after death. This condition gave rise to the term black death, which has been applied to certain epidemics. Large carbuncles may form in various parts of the body, and these are regarded as a very unfavorable sign.

A highly fatal form of the disease is accompanied by hemorrhages from the lungs. This was a noticeable feature of the pandemic of the sixteenth century, and it was also observed in the recent outbreak along the Volga. Such hemorrhages indicate a grave form of intoxication, and have been observed in the severer forms of other acute infectious diseases, such as smallpox.

The virulent form of the plague is often very rapid in its action, sometimes destroying life in a few hours, but the majority of fatal cases terminate about the fifth day. During an epidemic at Bagdad it was said that those who lived until the seventh day were safe, but, according to Colvill, 4 per cent. of the fatal cases terminated after the tenth day.

The mortality from the plague in its virulent form is probably as great or greater than any other of the acute infectious diseases. In many epidemics it may be more than 90 per cent.

Hecker gives the following statement, which must be an exaggeration, concerning the mortality of the black death: "Cairo lost daily, when the plague was raging with its greatest violence, from ten to fifteen thousand. In China more than thirteen millions are said to have died. India was depopulated. In Caramania and Caesarea none were left alive. On the roads, in the camps, in the caravansaries, unburied bodies alone were seen. Twenty-two thousand persons and most of the animals were carried off in Gaza within six weeks. Cyprus lost almost all its inhabitants, and ships without crews were often seen in the Mediterranean, as afterward in the North Sea, driving about and spreading the plague wherever they went on shore. It was reported to Pope Clement that throughout the East, probably with the exception of China, 23,840,000 people had fallen victims to the plague."

Probably the most constant pathological lesion found after death from this disease is an enlargement of the lymphatic glands. The disease may run so rapid a course that the enlargement of the glands is not observable during life, but, according to recent and competent observers, changes in these tissues will be found in the great majority of cases. This has led Cantline, who studied the disease at Hong Kong in 1894, to propose for it the appellation of "malignant polyadenitis." The same authority offers the following definition: "Plague or malignant polyadenitis is an acute febrile disease of an intensely fatal nature, characterized by inflammation of the lymphatic glands, marked cerebral and vascular disturbances, and by the presence of a specific bacillus."

Geographically the plague has been known as far East as the island of Formosa, where it now prevails; as far west as Ireland; as far north as Norway; and there is no definite information concerning its extension southward in Africa. It has never been known in the Western Hemisphere, but this is only due to the fact that up to the present time there has been no opportunity for its importation to this half of the world.

In this connection the following quotation from Hecker may be of interest: "The inhabitants of Iceland and Greenland found in the coldness of their inhospitable climate no protection against the southern enemy who had penetrated to them from happier countries. The plague caused great havoc among them. Nature made no allowance for their constant warfare with the elements and the parsimony with which she meted out to them the enjoyments of life. In Denmark and Norway, however, people were so occupied with their own misery that the accustomed voyages to Greenland ceased. Towering icebergs formed at the same time on the coast of east Greenland, in consequence of the general concussion of the earth's organism, and no mortal from that time forward has ever seen that shroe or its inhabitants."

There is no known racial immunity to this disease. It is alike fatal to Mongolians, Africans, and Europeans. It has prevailed in the marshes along the Euphrates and on the Himalayas; in densely populated cities and in sparsely settled rural districts; on the sands of Egypt and amid the snows of Norway.

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*Reprinted from Popular Science Monthly, May, 1897.

Climate and season have been studied in order to establish between them and the plague a causal relationship. Epidemics have followed prolonged droughts, and have prevailed during rainy seasons. The wind may blow where it listeth, but the bacillus heedeth it not. The epidemic at Hong Kong in 1894 appeared after a prolonged season of dry weather. Rain was anxiously looked for—probably prayed for. It was said, "All will be well when the rain comes." At last the rain did come, and with it the disease seemed to be refreshed and the number of deaths was multiplied. The attempt to find in meteorological conditions a cause for our ills is a relic of the superstition of ages when it was believed that disease was sent from heaven to afflict man for his sins, and was due to the anger of the gods.

Overcrowding is undoubtedly a factor in the distribution of this disease, as it is of all other infectious diseases, simply because it renders transmission of the germ from one to the other more speedy and certain; but that the disease can be due to overcrowding is, in the present state of our knowledge, an absurdity.

Poverty and famine are factors in the propagation of the disease. Want of proper food renders the individual more susceptible. This has been demonstrated in case of more than one infectious disease by experiments upon the lower animals. Privation has always been associated with the most notable outbreaks of the plagues. As stated in the beginning of this paper, famine and disease are twin brothers, inseparable. Where one of them dwells there the other may be found. This is undoubtedly the reason why this disease has always found a home in the Levantine. Cantline says: "In the densely packed cities of Asia the poor exist forever on the fringe of destitution, and the least rise in the price of food brings scarcity, so that the term, 'the poor man's plague,' holds good for all time."

There has been much written concerning the period of incubation of this disease, but necessarily all is indefinite. Because a well man comes in contact with a sick one on a certain day, and manifests the first symptoms of the disease ten days later, does not prove that the period of incubation is ten days. The well man may have carried on his person the bacillus from the sick room, and any time subsequent thereto it may have been introduced into the body. All that is said about the period of incubation of the infectious disease is based on the old theory—long since exploded—that the well man breathes in the miasm at the time of his coming into the presence of the sick one, while the truth is, he may carry the germ under his finger nail or elsewhere about him, and there is no telling when it may first find its way into his body. We can determine the period of incubation in the lower animals by inoculation, and here we know that it varies greatly with the method of inoculation, the virulence of the germ, the number of germs introduced, and the susceptibility of the animal. All that may be said about the period of incubation in man is of but little value. The same is largely true concerning the extent to which the disease is contagious. In the epidemic of 1835 in Egypt only one of the French physicians who attended the sick contracted the disease. Boulard, who did not believe the plague contagious, wore for two days a shirt taken from the body of a dead man. He remained well, and thought that by this he had demonstrated the truth of his theory. Such experiments demonstrate nothing. There is no evidence that any of the bacilli were on the garment, or that, if they were, they were introduced into his body. During the epidemic in Hong Kong, fifteen European physicians and a number of Chinese medical students cared for the sick in the hospital, and none acquired the disease. This only shows that with care and cleanliness the sick may be attended without danger of infection of the attendants. Hundreds of bacteriologists in laboratories are daily handling the most virulent cultures of the diphtheria bacillus, and the first case of infection from this source has yet to be reported. This does not prove that these bacilli are not pathogenic to man, or that these men are insusceptible to the disease. Because an expert handles the most venomous serpents without being bitten, does not prove that the bite of these reptiles is harmless.

The exaggerated idea of the contagiousness of the plague held by some of the older writers is exemplified in a graphic way by the following quotation from Hecker: "Every spot which the sick had touched, their breath, their clothes, spread the contagion; and, as in all other places, the attendants and friends who were either blind to their danger or heroically despised it, fell a sacrifice to their sympathy. Even the eyes of the patient were considered as a source of contagion which had the power of acting at a distance, whether on account of their unwonted luster or the distortion which they always suffer in plague, or whether in conformity with an ancient notion, according to which the sight was considered as the bearer of demoniacal enchantment."

The plagues of the middle ages were undoubtedly spread by the processions of the Brotherhood of the Cross. These fanatics went, sometimes in great numbers, from place to place, praying for the sins of the world, and scourging themselves with leathern straps armed with points of iron.

The horrors of the plague of the fourteenth century have been depicted by Hecker and others. The moral depravity brought to light by this great epidemic is hardly credible. Many believed themselves poisoned, and suspicion fell upon the Jews, who have so often been treated by Christians with barbaric cruelty. Under the torture confessions were made, and then began the wholesale slaughter of the children of Abraham. In Basle, the whole Jewish population was brought together in a wooden building constructed for the purpose and burned. "At Strasburg two thousand Jews were burned alive in their own burial ground. * * * At Eslingen the whole Jewish community burned themselves in their synagogue; and mothers were often seen throwing their children on the pile to prevent their being baptized, and then precipitating themselves into the flames. * * * In all the countries on the Rhine these cruelties continued to be perpetrated during the succeeding months; and after quiet was in some degree restored, the people thought to render an acceptable service to God by taking the bricks of the destroyed dwellings and the tombstones of the Jews to repair churches and to erect belfries."

Knowing, as we now do, the specific cause of the plague, we may easily predicate the modes of its distribution. Anything that carries the bacillus may be an agent of its transmission from one person to another, or from one country to another. It is needless to dwell upon this point.

Is there any danger of the plague being imported to this country? Yes, there is danger, but this being foreseen may be easily avoided. Thorough inspection of persons and disinfection of things from infected districts will keep the disease out of Europe and America. Only by the most gross carelessness could the plague be permitted to enter either of these continents. The method of disinfecting the mails from the Orient, as practiced by the English, is wholly inadequate, and the American authorities should redisinfect all such matter coming from the infected districts of India.

——It is reported that a project is on foot for the establishment of a co-operative wholesale drug house at Toledo, O.

——L. A. Barnes, druggist, of Torrington, Conn., has decided to dispose of his store at Collinsville, and is looking for a purchaser.

(Special Correspondence to the Era.)

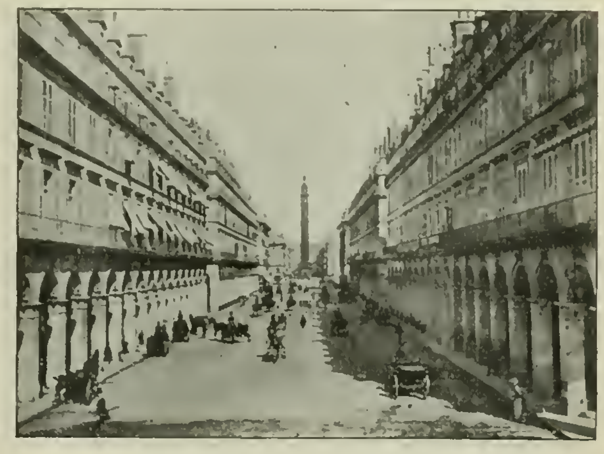
ANGLO-AMERICAN PHARMACY IN PARIS.

The visitor to Paris cannot fail to remark, in the western portion of the city, between the Bourse and Passy, the number of shop fronts bearing the inscription "English and American Pharmacy;" or some similar announcement. A casual observer, in fact, might be led to conclude that a goodly portion of the drug stores in the best quarters of the French metropolis are under Anglo-Saxon management. Such is far from being the case. Since the "American Pharmacy" on the Rue du Havre was disposed of by M. Rogers—a Frenchman by birth, but a naturalized citizen of the United States—not a single Parisian drug store (so far as I can ascertain) is in the hands of an American citizen. And, I may add, with but four or five exceptions, the whole of the so-called "English chemists" are of French nationality and education. In some cases, it is true, a qualified English assistant is regularly employed, but such is, unfortunately, not the general rule. Very often they have not in stock the most usual preparations of the British Pharmacopœia, and are unable even to read an English prescription; for Latin forms no portion of the French pharmacy curriculum since 1803, and English weights and measures are the despair of the foreigner accustomed to the "sweet simplicity" of metric calculation.

Such a request as "Please will you translate this prescription for Monsieur So-and-So" is often heard by the Englishman behind the dispensing desk in Paris, and though the sender may be the "cutting" rival just around the corner, professional etiquette induces the Minor or Major man to give such instructions as may assure a correctly compounded medicine being put up under "Monsieur So-and-So's" label. This is naturally looked upon as a grave abuse by English chemists here, but they are powerless to help themselves, except by making the fact as widely known as possible to visitors and residents.

THE ENGLISHMAN TO THE FORE.

Most of the genuine English pharmacists of Paris will be found clustering close around the Vendome column. Here, in the Rue Castiglione is Mr. Hogg, Senior, the first Englishman who ever took the modern French diploma (in 1850); a few doors further on is Mr. Swann, who was established very soon afterward. Hard by, in the Place Vendome, is Roberts' old established pharmacy, now belonging to Mr. Backhouse, nearly opposite which is the "Pharmacié Béral," now owned by Mr. Wesson. All these pharmacies are surrounded by numerous large hotels of a high class, and are in one of the best shop streets in Paris. They consequently do a large business among the wealthier portion of the floating and cosmopolite population of the French capital. Mr. Hogg's son (who holds the French M. D. degrees, as well as a "first-class" pharmacy certificate), occupies handsome corner premises on the Avenue des Champs-Elysees. This is near the American residential quarter, and he probably does a little more "family" business, and rather less hotel trade than the others mentioned.



Rue Castiglione and Vendome Column.

Most, if not all, of these pharmacists hold the "American Embassy" appointment, and the spread-eagle figures beside the English lion and unicorn on their windows.

This dearth of Anglo-Saxon druggists is explained by the fact that no foreign diploma is accepted here. Every man, no matter what his experience or attainments, must go through the lengthy and difficult course of study and examination already described in these columns, before he can open a pharmacy in France. And for some twenty years no American or Englishman has successfully passed the ordeal; and the old houses prosper in a way that rouses the jealousy of the average Parisian pharmacist.

Well placed and handsomely fitted up, the Anglo-Parisian establishments have a reputation for high-class medicaments which obtains for them a large custom among Frenchmen and foreigners, as well as the English speaking population and visitors. Most of them buy drugs on the London market, the best qualities obtainable in Paris being frequently inferior to the English standard of purity. Good profits on side lines—usually much neglected by French firms—and an unwritten but tacit agreement not to "cut" on patents, enable them to dispense at reasonable prices, and to employ capable and well-trained assistants drawn from some of the best Parisian pharmacists and London chemists. The French pharmacist, handicapped by cost-price sale of proprietary goods, must make his profit somewhere else, and often contents himself with assistants (students) of 16 or 18, for the sake of economy.

THE AMERICAN CONSPICUOUS BY HIS ABSENCE—WHY?

While the American population of Paris increases yearly in number, wealth and importance (half the titled families of this part of Europe number some Western heiress among their members nowadays), and the English population (I speak only of the wealthy class) has steadily fallen off since the Empire, it seems odd that no United States citizen has ventured to establish himself here. Hard, up-hill work doubtless awaits him at first (for he may be sure the French authorities will do little to facilitate foreign competition), and a certain amount of financial risk. But the real reason, I fancy, must be the loss of seven years to win a diploma which in America is easier to obtain. (The same reflection explains why no Englishman presents himself).

To begin young would doubtless be indispensable, the examinations, etc., all being held in French; and but little time would be left for earning a living while studying. It may also be observed that the French pharmacy must be run on very different lines to the American drug store. For instance, a group round a soda fountain would keep away French custom, though a refreshing drink may be kept handy for passers-by who may look in for that purpose. In the same way, a too pushing and commercial style is considered "bad tone," and though toilet sundries and hair brushes, etc., may be introduced to the Parisian purchaser, it must be done with much tact and discretion; for to him a pharmacy is a sort of Temple of Hygeia. "You see them take their hats off when they come in," an Englishman remarked to me. A very large store is necessary to keep three stocks—American, English and French goods; while Russians, Spaniards and other customers are likewise not only possible, but almost certain. Foreign patents are not always readily passed by the French customers; some firms turn this difficulty by preparing in Paris the goods necessary for their French trade. Listerine, bromidia, Fellow's syrup and other proprietaries are thus made up here. Of course, most of the English chemists also make up specialties of their own.

*"Pharmacie des Champs Elysees."—(Dr. Douglas Hogg, Proprietor.)**

It may be objected that these prosperous English houses have taken half a century to build up. But in conversation, the older pharmacists always seem to cite the Second Empire (1851-1870) as the best time for business, though in those days they were comparative newcomers.

At the Pure Food Congress recently held in San Francisco, Prof. E. W. Hilgard, of the University of California, quite pertinently remarked that the contention that salicylic acid is not injurious when used within limits as a food preservative is yet to be proven, and it must be shown that invalids are not affected. "We are not now living under the barbarous old-time dispensation of 'the survival of the fittest.' Possibly I, who know that I can't stand the use of preservatives, should be willing to drop out and die in order that the general status of the race may be improved. But I scarcely think that the rest of you would care to have the same rule applied to yourselves."

INSECT POWDERS OF COMMERCE.

By GEORGE REYNOLDS DURRANT.

During the past quarter of a century at least twenty eminent chemists, pharmacists and microscopists have devoted some attention to the physical characteristics, chemical constituents, and toxic properties of the insect powders of commerce. In the earlier part of this period the references were exclusively to the powder from the flowers chrysanthemum caucasicum, or Persian variety, which gradually gave way to the Dalmatian kind produced from the flowers of the chrysanthemum cinerariæfolium, and it is possible that the Dalmatian replaced the Persian variety because the latter was the first kind to be grossly adulterated; at least, it is true in my experience that both kinds are equally useful if equally free from sophistication.

A careful study of the whole of the literature of the subject is more likely, in the absence of much personal experiment and thought, to confuse the reader than to provide him with such information as will enable him to distinguish the true powder from sophistications, which are still as common, although changed in character, as they have been at any time since the Persian powder gave way to its honester rival. To any one who has worked on this subject for a few years the last paragraph may appear to be superfluous, but it is evident that there is still a plentiful lack of knowledge on the part of the majority of buyers, or it would be impossible to account on any other hypothesis for the enormous amount of grossly sophisticated insect powder which is sold as genuine every season.

The object I have in view in recording the results of several years' attention to this subject is to provide a ready means of quickly and cheaply ascertaining if a given sample of insect powder is what it is represented to be by the seller, but before proceeding to this part of the subject it will be profitable to briefly set forth the results of the work of other investigators. These references will not be by any means exhaustive of the subject, but will include most of the literary notices which have come within my own knowledge.

It will be found that the literature of the subject divides itself into the following sections:

(a). Toxic constituents.

(b). Microscopic appearance.

(c). Adulterations.

It is intended to keep to this division of the subject so far as may be possible and convenient.

So far back as 1863, Hanaman Roch (National Dispensatory) attributed the insecticidal value of the powdered flowers of Chrys. caucasicum to a volatile oil. Some years after, in the seventies, Semenoff appeared to be practically in agreement with this statement, but treated the matter more broadly, if less definitely, by substituting "volatile substance" for the more definite, if less accurate, "volatile oil." Immediately after (in 1876) Jousset de Bellesme stated that, in his opinion, the active toxic principle was a crystalline alkaloid. In 1877 this last statement was corrected by R. Rother (Druggists' Circular) in a paper giving the results of a very systematic and practical investigation; the conclusions at which this writer arrived at are as follows: There is no crystalline alkaloid; there are (a) an oleoresinous greenish-yellow acid, "persicein"; (b) another acid body, "persiretin," both inactive; (c) active principle, a glucoside converted by boiling into "persiretin" and glucose. These constituents are all soluble in ether, alcohol, benzine, and petroleum ether, and insoluble in chloroform. With the latter part of the statement, referring to the solubility of all the constituents of any value in ether, etc., I can cordially agree. Very shortly after the appearance of this article by Rother a notice appeared in the Bulletin Soc. Chim. by G. Dal Sie, in which he claims that the active toxic principle is to be found in a volatile acid existing in the flowers in a free state. M. Finzelberg (Pharm. Centralhalle, 1880.) proved that a concentrated tincture of the flowers had definite insecticidal properties, and this statement has been confirmed by my own experiments on flies. O. Tester (Pharm. Journ. (3), xii., 359.) states that the active principle is a soft resin. At the British Pharmaceutical Conference, 1888, a paper was read by William Kirby on the microscopical characteristics of the flowers of C. caucasicum and C. cinerariæfolium. The paper was valuable so far as the subject was treated, but it was less complete than the author intended, inasmuch as sophistications were not taken into consideration. Although the paper itself was thus limited in scope, the discussion which followed covered the whole ground. Mr. Robinson expressed his incredulity at the presence of any toxic agent, but this bold sceptic was crushed by the president, assisted by Mr. Howie and Mr. Martindale. In the Pharm. Zeitschr. für Russland, 1890, E. Hirschsohn states that the active principle is neither a volatile oil nor an acid resin; this statement is neutralized by F. Schlagdenhauffen in an article in the Pharm. Zeitung, 1892, in which he states that he found the toxic properties to be (a) yellow volatile oil, and (b) uncrystallizable soft resinous mass (pyrethrotoxic acid) very soluble in ether. It seems to me that the average buyer of insect powder, after careful consideration of the foregoing evidence by so many able men, would remain more or less doubtful as to the properties and characteristics for which he ought to look in deciding upon the value of the various qualities to be found in the insect powders of commerce. The results of my own work on this part of the subject may be briefly stated as follows:

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*The lady in the illustration is the cashier of the pharmacy. I mention this to prevent any erroneous impression as to the employment of female drug clerks in Paris. The cash desk was, in days gone by, the special province of the pharmacist's wife or sister; nowadays, this custom is almost extinct, but lady cashiers are still to be found in a few Parisian establishments.

The toxic properties are due to—

(a) A volatile oil amounting to 0.5 per cent. in picked specimens of closed flowers and much less in open flowers.

(b) A soft acid resinous body; this is the principal source of the toxic effect. It is found to the amount of [illegible].8 per cent. in selected closed flowers, less than 4 per cent. in half-open flowers, and still less in flowers that were fully open; the whole plant apart from the flowers contains mere traces of resin.

The fine dry powder, after exhaustion with ether, has no decided toxic properties, but numerous experiments on beetles convince me that this exceedingly fine powder contributes something to the insecticidal properties by its physical action, perhaps by its effect on respiration reducing the vitality of the insect, and also by impeding locomotion and preventing a speedy retreat from noxious surroundings and a safe return to the customary lodgings. The toxic properties of the volatile oil and resin may be proved by isolating them and mixing them with an inert powder whose physically deterrent equation has been ascertained by experiment on beetles. I believe no vivisection license is required for this.

Having referred to the toxic constituents of, and the proportions in which they exist in, genuine powder of the flowers of C. cinerariæfolium, it is very important to mention the fact that chlorophyll, in its green unchanged form, is not found in selected dried, closed insect flowers, as this fact has an important bearing on one (and I think the most prevalent) form of sophistication to be found in the present insect powders of commerce. I cannot fully explain why it is that insect powder from half-open and from flowers that are fully developed should show a certain amount of chlorophyll coloring in the ether extract, but it may possibly be that less care is taken in collection of these than is the case with the more valuable closed flowers. But whatever may be the cause, the fact remains that insect powder ground from selected closed flowers is sensibly free from chlorophyll, whereas traces of it (less than .5 per cent.) will be found in powders prepared from mixed and half-open flowers, and in the foreign ground insect powders it often amounts to from 50 to 80 per cent. of the total ether extract. Samples have been recently examined by me yielding 6 per cent. of ether extract, of which more than two-thirds was owing to chlorophyll. It will therefore be seen that any estimate of the value of insect powder based upon the percentage of ether extract would be quite fallacious unless the chlorophyll be also determined and deducted from the total. Microscopical examination is useful in distinguishing the grosser forms of admixture, such as powdered quassia and the woody tissue of the leaves and stems of the plant, but this latter form of sophistication can be determined by the method given further on. (For full particulars of the microscopical appearance of true insect flowers, the reader is referred to the paper by Mr William Kirby, F. R. M. S. (Proc. Brit. Pharm. Conf., 1888).

Adulterants.—In using the term adulterants as applied to our subject, it is intended to imply the presence in insect powder of anything but the flowers of C. cinerariæfolium. Adulterators of insect powder have for their first object the cheapening of the article sold, and occasionally they have a second object, i. e., to improve its color.

The first object has been achieved in the past by the addition of powder of quassia, aloes, senna and Hungarian daisy, and the artistic eye of the ignorant buyer has been satisfied by the addition of the powder of fustic, turmeric and chrome-yellow. The presence of quassia, fustic and turmeric may be detected by the aid of the microscope, and chrome-yellow (salt of lead) chemically. The presence of the powder of Hungarian daisy is more difficult to detect microscopically, but it yields 10 per cent. of ash, whereas true insect powder yields 6.5 per cent. On this point the reader is referred to an extract from a paper by J. Schrenk (American Journal of Pharmacy, 1889,) in the Year Book, 1890.

It is hoped that it will not be difficult to accept my contention that by the term insect powder it is intended by both buyers and sellers that powder of the flowers of the C. cinerariæfolium is understood, at least so far as transactions in the open market are concerned. Owners of proprietary insect powders have a right to compound them as they please, and this right has been freely exercised by the use of powdered quassia, colocynth, etc., as well as by the addition of various coloring agents. Although powdered quassia mixed with powdered insect flowers must be considered to fall under our definition of adulteration, it is quite possible that a small proportion is useful in insect powder, increasing or broadening the base of its usefulness. The same remarks apply to other admixtures, such as powdered bitter apple, and the only criticism to be made on this point is that if powdered quassia or other powders having insecticidal properties be added to insect powder, let it be done with the knowledge of buyers and at the proper price.

The adulterants just referred to are for the most part things of the past, with the exception of added coloring matters, which are still very commonly used to meet the too general want of knowledge of the proper appearance of true insect powder. At the present time the insect powders of commerce may be divided into the following classes:

1. Ground from closed, (a) wild, or (b) cultivated flowers of C. cinerariæfolium.

2. Ground from half open or mixed half open and open flowers.

3. Ground from damaged flowers.

4. Foreign ground, divided into grades of badness under the meaningless terms: "Closed flowers," "half open flowers," etc., etc. Of these sorts there appears to be as many as there are of hen's eggs, which embrace all the kinds between "new laid" at the top of the list, and "political" at the bottom. The English ground insect powders do not always justify the description given, but, in my experience, the foreign-ground speci-

mens never do, and it is with much satisfaction that it is noted that a ready method of distinguishing "foreign ground" is to hand.

It will be seen from the remarks made on the toxic constituents of the flowers of C. cinerariaefolium that the following statement embraces the results of my own experience as well as that of the majority of laborers in the same field:

That the value of insect powder is in direct proportion to the combined amount of essential oil and soft acid resin, and in inverse proportion to the amount of chlorophyll—both statements to be read together.

It has not been my good fortune up to the time of writing this to have met with one sample of "foreign ground" insect powder that was not grossly sophisticated.

A perfect sample of insect powder should pass a sieve having at least eighty meshes to the linear inch; the particles would be, therefore, approximately 1-160th of an inch in greatest magnitude. (The powder has been passed through a sieve with 100 meshes to the linear inch, but 90 is the more usual number). The powder should yield 5.25 per cent. of combined essential oil and soft resin; chlorophyll should be absent or present in the merest trace.

The following simple method of testing the value of insect powder should be adopted by all chemists who wish to sell a genuine powder, or, to put the matter on lower grounds, who wish to increase their sale of this really important commercial product. Place 100 grains of the powder to be tested in the cylinder of a glass syringe (1 oz.) The powder should be pressed down compactly on to a piece of absorbent cotton, to act as a filter. Moisten with ether .735. Close the top of the syringe, and macerate for thirty minutes; percolation may then proceed; the powder being repercolated with the same fluid four times, and finally washed through with sufficient ether to make up one fluid ounce. The resulting percolate should be of a rich, yellow color, if a pronounced green color be the result the sample may be discarded at once.

In the absence of much green coloring matter, the fluid may be carefully evaporated (temperature not exceeding 200° F.), and the residue weighed in a tared watch glass. The resulting soft mass should not weigh less than 3.75 grains, and in the finest samples reaches 5.5 grains, and should have the pleasant and characteristic odor of flowers.* At the present time the price of insect powder varies between 8d. and 2s. 2d. per pound, the highest price representing the value of English ground powder from closed flowers and the lowest powder "foreign ground" from the whole plant. This ground whole plant appears to be the principal sophistication, apart from coloring matter, found in commerce at the present time.—(Pharm. Jour.)

The Cleveland (O.) Press and St. Louis Chronicle both believe in using molasses instead of vinegar in the substitution matter. They divided their respective cities up into sections and offered a prize of thirty dollars to the druggist in each section who would sell the largest quantity of proprietary preparations during two months. The idea was put in force with the belief that the rivalry of the druggists to outsell each other would prevent them from substituting. These papers also report to their advertisers the number of drug stores in their respective cities, the number that have the advertiser's goods in stock, the attitude of the druggists toward them and names of articles used in substituting.

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* Exactness may require the determination of the chlorophyll. If an appreciable amount be present this may be done by boiling the residue in dilute sulphuric acid and volumetrically determining the converted chlorophyll as glucose with a suitable copper solution. For my own purposes I should unhesitatingly reject the sample rather than take this unnecessary trouble, unless a fee were attached to the operation.

PHARMACY.

THE AGE OF THE EARTH.—Lord Kelvin, in an address upon the earth as an abode fitted for life, has summed up the evidence into what must be accepted as the latest dictum of science regarding this obscure point. The old idea was of a solid earth nearly 20,000,000,000 years old, but modern science makes an immense reduction in this estimate. He was able to say with confidence that the earth solidified between 20,000,000 and 30,000,000 years ago. The latest estimate of the time required for the formation of all strata since the beginning of the Cambrian rocks is 17,000,000 years. Lord Kelvin declares that the earth could not have been habitable more than 30,000,000 years.—Sci. Am.

SPECTOGRAPHIC ANALYSIS OF MINERALS.—W. N. Hartley and H. Ramage have recently examined a large number of ores and minerals by means of spectographic analysis, says the Mining and Scientific Press (Sci. Am.) Most notable is the wide distribution of gallium, which was found in 68 out of 168 specimens, occurring in most magnetites, bauxites and blendes, and nearly half the clay ironstones and manganese ores. Rubidium appears to be even more widely distributed, occurring in most iron ores. Indium was found in thirty minerals, including all the carbonates of iron and tin ores and most blendes. Thallium, while less widespread, was frequently found. Iron and sodium were found in every specimen, and potassium in all but two, one a blende and the other a tin ore. Calcium, copper and silver were found in all but a few cases. Such a wide dissemination of gallium and indium is unexpected, and the same might be said of silver. Among metals not looked for by the authors, titanium is known to be found almost universally, and possibly the same is true of gold.

THE JUBILEE'S EFFECT.—They are keen volunteers in Cheltenham, and certain dentists in the town are the keenest "citizen soldiers" of them all; but an old gentleman with a raging toothache made no allowance for patriotism when he rushed up to a door bearing the names of three dentist partners, whom we will call Brown, Jones, and Robinson, on the plate.

"Is Mr. Brown in?" asked the toothachy gentleman, when the butler opened the door.

"Colonel Brown has gone to a battalion inspection," replied the stately menial.

"Is Mr. Jones in?"

"Captain Jones is superintending his company at musketry."

"Is Mr. Robinson in?"

"Surgeon-Captain Robinson is conducting an ambulance drill, sir."

"Well, fire and brimstone and volcanic explosives! Have you a blanked admiral on the premises who can pull my tooth out?"—(Br. & Col. Dr.)

FLOOR-POLISHING.—If the floor is dirty and spotted, it must first be washed with a strong solution of lye, and rinsed with soft water, and very bad spots must be sand-papered or planed. When the floor is thoroughly dry it is given a coat of boiled linseed oil, with dryer, which is allowed to soak well into the wood and dry. It is then given a coat of white shellac, and in two or three days the finishing coat may be applied. This is composed of a mixture of yellow wax and turpentine, dissolved with the aid of heat to the consistence of petrolatum. This mixture is rubbed into the floor in small quantities with a piece of waste, and polished with a weighted brush. The brush must be occasionally scraped with a blunt knife, to remove the excess of wax; and, when the floor has been completely covered by this treatment, a clean brush is taken and the whole floor is gone over again lightly, but without any wax. This method has been used for maple floors in one of our public institutions for over four years, and has been most satisfactory. Once a month they are gone over with a weighted brush and a little wax, but are not washed under any consideration.—W. F. Roach, in Merck's Report.

LIQUID AIR AS AN AGENT OF RESEARCH.—In his second lecture on "Liquid Air as an Agent of Research," delivered at the Royal Institution, says The Engineer (Sci. Am.), Professor Dewar continued his remarks on the critical constants of gases, and brought forward some interesting speculations founded on this extension of certain laws, known by experiment to hold good at accessible temperatures, to bodies which one could never hope to be able to examine in the liquid state. With regard to the theory that carbon is a very important constituent of the sun, he pointed out that the density of the latter was 1.4. Supposing it to consist of carbon at the critical temperature, its density when cooled to liquefaction would become 4.2, according to known laws, and if it were cooled to the temperature of this earth, its density would increase by something like one-quarter. Therefore, the density of the materials of the earth—which was 5.5—did not appear to be far removed from the density of the sun at the same temperature. The lecturer, for the first time in public, froze a specimen of argon, supplied by Lord Rayleigh, to the solid state by means of liquid air at a temperature more than 200 degrees below zero.

PAIN AND ITS THERAPEUSIS.—Dr. S. V. Clevenger, after pointing out the disadvantages of various analgesic drugs states that Lactophenin is destined to supersede largely the entire array of analgesics proper, owing to its non-toxic peculiarities and the feeling of comfort described by many physicians as following its use. It affords the best results with the least ill effects. Its range of incompatibility is less than other synthetic compounds, and it may be combined with caffeine, quinine and salicylic acid. The minimum dose of 5 to 10 grains may be increased until a daily maximum of 45 grains has been reached. It is but slightly soluble in water, although acting promptly, so that it can be given dry, and be washed down with a drink of water. A dose of 15 grains usually acts as a feeble hypnotic. There are no untoward symptoms following its use, and contrary to the experience with some synthetic drugs, the pulse becomes fuller and stronger under its use. The range of application is extensive, and the testimony of the author is in corroboration of the findings of other physicians as to its superior analgesic effects, its safety and promptness of action.—R. W. Wilcox, M. D., in Amer. Jour. Med. Sciences, quoting from Jour. Amer. Med. Asso.

FREEZING POINT OF MERCURIAL THERMOMETERS.—Dr. J. A. Harker, in a paper recently read before the Royal Society on the determination of the freezing point of mercurial thermometers, stated that the method adopted is to cool distilled water in a suitable vessel to a temperature below 0 degree, to insert the thermometer, and then bring about the freezing of the water by dropping in a crystal of ice. The thermometer then rises, and finally attains a steady temperature, differing only very slightly from the true zero. The apparatus employed consists of two portions, the thermostat and the cooler. The former is a copper vessel, filled with either refined petroleum or a strong solution of common salt. The vessel communicates with the cooler, through which the liquid can be pumped by a rotary stirrer, and by this means it can be cooled and maintained for some time at about — 2°. The distilled water to be frozen is contained in a glass tube of about 300 c. c. capacity. This is first placed directly into the circulating liquid, and cooled quickly to — 0.5° or — 0.7°. It is then transferred to a cylinder lined with polished metal, placed in the center of the thermostat. The thermometer whose zero is to be taken is then quickly fixed in position, the bulb and a considerable length of the stem above the zero being immersed in the water. A crystal of ice is dropped in, and the temperature quickly rises to the freezing point. (Sci. Am.)

Champagne Soda.

Oenanthic ether	1	dram
Tincture celery	30	gtt.
Tincture balsam Peru	30	gtt.
Amylic ether	2½	drams
Tincture vanilla	3	ounces
Lemon juice	32	ounces
Neutral spirit, 94 per cent	8	ounces
Syrup, enough to make,	1	gallon

The flavor is said to resemble champagne and to make a magnificent soda fountain drink.—Registered Pharmacist.

Liquid Starch Gloss.

Distilled water, fluid measure	100 parts
Borax, by weight	10 parts
Gum arabic, by weight	10 parts
Spermaceti wax, by weight	10 parts
Glycerine, by weight	27 parts
¼ per cent. oil of lavender.	

Dissolve the borax in water, and then dissolve the gum in this solution, and gently warm it sufficiently to dissolve the wax. Then put the whole into a warm stoneware mortar, and rub up the whole until the wax has emulsified (i. e., formed a cream-like emulsion) with the fluid. Then gradually add the essential oil, and finally stir in the glycerine, being careful to stir all the while it is being added, so as not to cause the separation of the components. Some little skill is required in forming an emulsion, for if not properly done the ingredients will separate on standing or on the addition of water. In a properly formed emulsion no such separation will occur. One secret of success consists in stirring the mixture always in one direction, say from left to right; never reverse the stirring process, or you will assuredly cause separation of the constituents. Another secret is to maintain the temperature constant until the last morsel of wax has entered into combination—it is only a physical not a chemical one—with the other ingredients. In the last formula the glycerine may be dispensed with if desired. The directions for use are to be: One teaspoonful of the liquid gloss added to each pint of boiling-hot starch made in the usual way, and the fabric starched in the usual way. Or the linen may be first starched in the usual way with plain starch, and then a rag dipped in the gloss, squeezed out, and lightly smeared over the starched portion, and the ironing proceeded with as usual.

Starch Glaze (Powder)

Gum arabic, powdered	3 parts
Spermaceti wax	6 parts
Borax, powdered	4 parts
White corn starch	8 parts

Method of preparation.—All these bodies are to be intimately mixed in the powder form by sifting through a sieve several times. As the wax is in a solid form, and does not readily become reduced to powder by pounding in a mortar, the best method of reducing it to such a condition is to put the wax into a bottle with some sulphuric or rectified ether, and then allow the fluid to evaporate. After it has dissolved the wax, as the evaporation proceeds, the wax will be deposited again in the solid form, but in fine thin flakes which will easily break down to a powder form when rubbed up with the other ingredients in a cold mortar. Pack in paper or in cardboard boxes. To use, four teaspoonfuls per pound of dry starch is to be added to all dry starch, and then the starch made in the usual way as boiled starch.—(Canadian Druggist.)

QUESTION BOX

The object of this department is to furnish our subscribers with reliable and tried formulas and to discuss questions relating to practical pharmacy, prescription work, dispensing difficulties, etc. Requests for information are not acknowledged by mail and ANONYMOUS COMMUNICATIONS RECEIVE NO ATTENTION.

Unanswered Queries.

We have received this week queries from a number of correspondents who are not subscribers, nor clerks of subscribers. To these we would repeat the information given in these columns a few weeks ago, viz., this department is conducted for the benefit of subscribers and their clerks, the demands upon our time and space forbidding any other arrangement. Clerks of subscribers are invited to make use of these columns, but in submitting their queries they must give their employers' names. Queries not answered are from S. J., Washington; E. J. W., Allegheny, Pa., H. C. V., Baltimore, and W. H. P., Chicago.

White Dextrin.

(C. J. B.) Pure white dextrin in powder may be obtained from any of the drug jobbers in this city. The price quoted is 7½ cents in bag lots.

Maryland Pharmacy Law.

(R. L. H.) Maryland has a pharmacy law which applies to the city of Baltimore only. Any one is at liberty to conduct a pharmacy elsewhere in the State.

Cigar Box Flavor.

(O. P. O.) A member of the trade says there is nothing better than the old-fashioned mixture of valerian and tonka. Try the following: Fluid extract valerian 1 ounce; tincture of tonka 8 ounces; alcohol 23 ounces.

Characters in the Ash of Cigars.

(O. P. O.) A tobacconist in this city informs us that the process by which the characters or letters of a name are reproduced in the ash of a cigar when smoked, is covered by letters patent. We cannot give you the formula.

To Prevent Common Solder from Tarnishing.

(J. K.) We know of nothing which can be mixed with common solder to prevent it from tarnishing. The addition of almost any substance to the ordinary soft solder, an alloy of tin and lead, would be apt to considerably change its character and usefulness.

Formulas for Tablet Triturates.

(H. B.) This journal has published any number of articles and formulas on the manufacture of tablets and tablet triturates which you can easily find by consulting the various indexes. Two valuable little books upon the subject are "Tablets, Tablet Triturates, and Compressed Suppositories," by Prof. Virgil Cobletitz, published by Whitall, Tatum & Co., of this city, and "How to Make Tablets" by Frank Edel.

Solution Calcium Bisulphite.

(A. F.) According to Roscoe and Schorlemmer, a solution of calcium bisulphite in aqueous sulphurous acid is met with in commerce. It is obtained by passing sulphur dioxide into milk of lime, and is used by brewers to give beer stability. Here is a formula: Suspend 10 parts of chalk in 100 parts of water, and pass a current of sulphurous acid gas through the mixture until the solution is saturated. If you desire to make this solution on a large scale, you will have to adopt a more economical method for making sulphurous acid than the one generally employed, viz., generating it in a flask or retort from charcoal and sulphur.

Acetanilid in Solution.

(I. J. & J. H.) A clear solution cannot be made from the following prescription:

Acetanilid	1 dram
Water	4 ounces

Mix and use to spray the throat.

Acetanilid is comparatively insoluble in water (I in 194). The quantity of water prescribed is sufficient to only dissolve about nine and one-third grains.

Elixir Lactated Pepsin.

(W. D. C.) The formulas given for this preparation, page 722, June 17, 1897, issue of this journal, are based upon the formula for compound digestive elixir of the National Formulary which contains practically 75 grains of pepsin to the pint of elixir (10 gm. to 1,000 cc.) Regarding the quantity of pepsin directed you can, of course, use as much as you desire. There are pepsins and pepsins, varying in digestive power, and the preparations made from them by the various manufacturers vary as widely. The formula given by the National Formulary calls for pepsin which answers the official requirements (1 to 3,000). Why use any other?

Sea Foam.

(H. L. S.) The Era Formulary gives the following:

(1)	Tincture arnica	1 dram
	Tincture cantharides	2 drams
	Aqua ammonia	3 drams
	Alcohol	½ pint
	Soft water	½ pint
(2)	Aromatic spirit of ammonia	2 drams
	Glycerine	2 ounces
	Alcohol	4 ounces
	Water, enough to make	1 pint
	Extra Soapy.	
(3)	Potassium carbonate	½ ounce
	Castile soap, powdered	1 ounce
	Water	8 ounces
	Tincture quillaja	1 ounce
	Oil bay	5 minims
	Alcohol, enough to make	1 pint

Treatise on Apium Petroselinum.

(F. R. B.) There is no complete treatise devoted sole to a consideration of apium petroselinum (parsley), a so far as we are aware there has been no effort to co pile a complete bibliography on the subject. However you can obtain considerable information on the work done by various investigators by consulting the dispensatories, annual proceedings of the A. Ph. A. (1853 to 1896, inclusive), and files of the Era and other drug journals. For special information regarding apiol and oil of parsley, consult New Remedies, January, 1880, page 7, and Schimmel's Reports, respectively. For the chemistry of the oxidation products of apiol, see Pharm. Post, June 17, 1888, pages 391 and 392. All the works cited above may be found in the library of the University of Michigan, Ann Arbor.

Remedy for Diabetes.

(J. K.) The treatment for any case of diabetes should be outlined by a competent physician, for the pharmacist is not competent to diagnosticate the specific character and gravity of the disease. Many works have been written upon the subject and the authors vary widely in the methods of treatment laid down. They all agree, however, that the prognosis of diabetes mellitus is always grave, while that of diabetes insipidus is not so dangerous as regards life, although death may result from a casual or intercurrent affection. In a general way, the treatment of diabetes mellitus consists in arranging the diet. Ordinary bread, potatoes, beans, peas, rice, etc., and all articles containing flour, sugar, starch, etc., must be excluded. Aitchison says that diabetic bread must be resorted to, and milk may be allowed—especially buttermilk, and skimmed milk. Meat (fresh or salt), fish, oysters, eggs, fats, and nuts are allowable. A few drops of sulphuric acid in water will satisfy thirst. Walking exercise is to be encouraged. Of the medicines used, opium and codeia have been found the most useful. Arsenic with opium is also a useful combination. In the treatment of diabetes insipidus Hartshorne (Essentials of Practical Medicine) states that potassium nitrate, valerian, ergot, iron, alum, lime water, tannic and gallic acids, creosote and potassium bromide are the medicines most worthy of trial.

Compound Elixir of Calisaya with Phosphates.

(G. D. C.) We see no reason why you should not get a clear solution from the formula for the elixir given on page 175, Feb. 11, 1897, issue of this journal. We suggest you try it over again, using syrup lactophosphate of lime which answers the pharmacopœial requirements. Here are two other formulas of a similar character:

(1) Syrup lactophosphate of lime U. S. P.	4	fl. ounces
Syrup iron lactophosphate	2	fl. ounces
Dilute phosphoric acid	1	fl. ounce
Quinine sulphate	32	grains
Alcohol	4	fl. ounces
Spirit orange	4	fl. drams
Water	4½	fl. ounces

Dissolve the quinine sulphate in the alcohol previously mixed with the acid and spirit of orange; pour this solution into the syrups previously mixed with the water, allow to stand for two days, and filter.

(2) Elixir cinchona,
Compound syrup of phosphates, of each 8 fl. ounces

Bandoline.

(H. E. W.) Here are some formulas from the Era Formulary:

1.—Boil Iceland or Irish moss in water, strain, and perfume the fluid.

2.—Isinglass, 1 ounce; water 1 pint; proof spirit, 2 fluid ounces. Dissolve the isinglass in the water by heat, add the spirit, and scent with bitter almond oil.

3.—Quince seed, ¾ of a teaspoonful, and add a pinch of white mustard seed. Boil in a pint of soft water to half a pint, and scent with oil of almonds.

(4) Gum tragacanth	1½	drams
Water, distilled	7	ounces
Proof spirit	3	ounces
Otto of rose	10	drops

Macerate the gum in the water until completely dissolved, strain and add the spirit with the otto previously dissolved in it. If a rose-colored bandoline be required a few drops of cochineal color should be added to the spirit.

Cement for China Ware.

(T. L. H.) Try one of the following:

(1) English Cement for Porcelain.—Soak 1 dram of isinglass in water; pour upon this a sufficient quantity of alcohol to cover the isinglass, and allow it to dissolve, placing it in a warm room. Next dissolve ½ dram of mastic in 1 fluid dram of rectified spirit of wine; mix both solutions together, add ½ dram of powdered gum ammoniac, and evaporate the mixture in a water bath until it has acquired the requisite consistency. Keep the cement in a glass bottle, and when it is to be used place the bottle in hot water, when the cement will become soft so that it can be conveniently applied to the fragments of porcelain to be cemented, which should be previously heated.

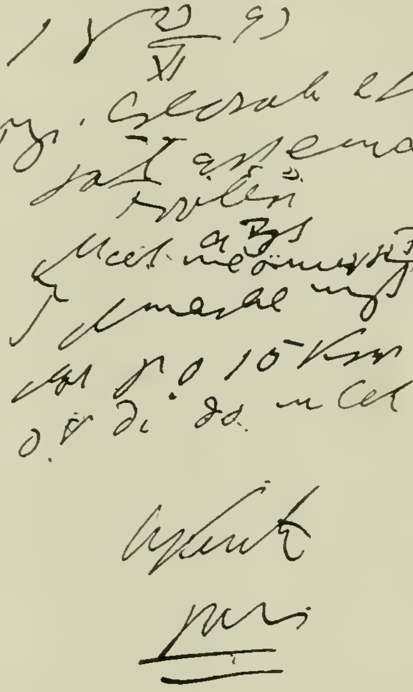
(2) Milk is coagulated by means of acetic acid, and the caseine thus formed is well washed in water, and then dissolved in a cold saturated solution of borax; a clear solution is thus obtained which is superior to gum arabic in adhesive power, and is colorless. For porcelain, this liquid is mixed with finely powdered quicklime, and the resulting cement is quickly brushed over the fractured surfaces, which are then bound together; the ware is then dried to a gentle heat.

(3) Soak ordinary glue in water until it softens, and remove it before it has lost its primitive form. After this dissolve it in linseed oil over a slow fire until it is brought to the consistence of a jelly. This glue or paste may be used for joining any kinds of material. In addition to strength and hardness it has the advantage of resisting the action of water.

Other formulas have been published in the Era. Consult indexes.

Polish Prescription Translated.

A valued correspondent from Hungary sends the following translation of the Polish prescription submitted in the columns of this department, May 13, 1897:



Kreosoti e fagi,	
Sol. arsen. Fowleri	aa dch. semis.
Acet. meconicæ	gr. semis.
Tinct. amaræ	uncia semis.

Nickel-Plating.

(J. K.) In nickel-plating the double sulphate of ammonium and nickel is the salt generally used. Any common form of battery may be used, but the anodes should considerably exceed in size the articles to be covered with nickel. The power of the battery must not be too strong or the deposited nickel will be black. A strong solution of the sulphate of nickel and ammonium is made and placed in any suitable vessel; a glazed stoneware jar answers very well, if the articles to be covered are small. Across the top of this are placed two heavy copper wires, to one of which the articles to be covered are suspended, the other to the anode. The wire leading from the zinc to the battery must then be connected with the wire from which the articles are suspended, the other battery wire being connected with the anode.

To prepare the articles for coating, they must be well cleansed by scrubbing, immersing in boiling potash to remove any grease, then dipping them for an instant in muriatic acid, and afterwards washing thoroughly in water, taking care that the hand does not come in contact with any part of them. This is accomplished by fastening a flexible copper wire around them and handling them by means of it. The wire serves afterwards to suspend them in bath.

If the articles are made of iron and steel, they may be first covered with a thin coat of copper. This is best done by the cyanide bath, which is prepared by dissolving precipitated oxide of copper in cyanide of potassium. A copper plate is used as an anode. After they are removed from the copper bath, they must be washed quickly with water and placed in the nickel bath. If allowed to become dry, or to tarnish, the nickel will not adhere. Great care must be observed during the whole process to keep all grease, dust or other dirt from the articles to be coated, or else the result will be unsatisfactory. The whole process is one of the most difficult that is used in the arts, it being far easier to gild, plate or copper an article than to nickel it; but if due care is taken the results will will amply pay for the trouble.

Silver Plating.—For silver plating, the bath consists of potassium silver cyanide, prepared by precipitating solution of silver nitrate with potassium cyanide and dissolving the washed precipitate in excess of potassium cyanide solution.

Potassium cyanide	12	ounces
Water	1	gallon
Silver cyanide, about	1	troy ounce

Filter and use in a porcelain or glass vessel. For the whitening bath dissolve 1 lb. potassium cyanide in 1 gal. water, add ¼ troy ounce of silver cyanide and filter the solution. The baths are provided with silver feeding-plates for anodes proportionate in size to the surface of the work to be plated. These are connected with the positive pole of the battery. The cleaned articles are connected by a copper wire with the zinc pole of the battery, dipped for a minute or two in the whitening-bath, and when uniformly coated with a white film of silver, transferred to the plating bath under similar conditions. After the work is thoroughly cleaned and just before putting it into the bath, dip it momentarily in strong nitric acid or a mixture of equal parts nitric and sulphuric acids and rinse quickly. After this treatment it is sometimes dipped into dilute mercurous nitrate solution and rinsed again. This has the effect of coating the clean metal with a film of mercury, which secures a perfect adhesion of deposited silver.

Manufacturing Jervine.

(H. E. W.) Jervine is an alkaloid obtained from both veratrum viride and veratrum album. Salzberger. (Pharm. Jr. (3) XXI., page 745), gives the following process, known as the Baryta Method:

Each kilo of the finely powdered rhizome is well mixed with 300 grams powdered barium hydrate and then moistened with sufficient water (about 500 grams) to allow of the easy extraction of the mixture with ether. This quantity of hydrate has been found by experiment to ensure the removal of nearly all the alkaloid in ethereal solution, the process of shaking with ether being, for the sake of safety, carried out in large tin canisters of 10 litres capacity, provided with brass screw-tops and India rubber washers. About five kilos of ether are required for each kilo of powder, the ether being added in three successive portions. After evaporation of the ether at a low temperature by means of a copious stream of hydrogen, the residue forms a thin dark-green syrup, which possesses an exquisite anise-like odor, and deposits after several days a considerable quantity of cone-shaped crystals. The green mother-liquor is poured off, and the crystals, which consist principally of jervine, washed with ether upon a filter until the washings are colorless. Fifty kilos of powdered root yield about 50 grams or 0.1 per cent. of crude alkaloid. Upon re-crystallization of the impure jervine out of absolute alcohol, about 5 per cent. of the nearly insoluble proto-veratridine remain undissolved, while the alcoholic solutions contain about an equal quantity of rubijervine.

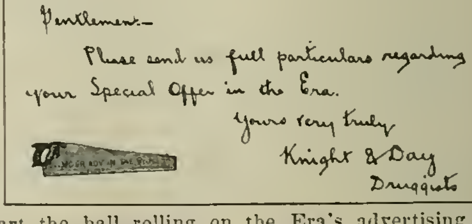
Another process is that known as the Metaphosphoric Acid Method, as follows.

It is advisable to first extract the crude drug with ether or petroleum ether in order to free it from fatty and resinous matters. About 2 per cent. of a green fat, in which brown resinous lumps and a considerable quantity of characteristic crystals of fatty acids are incorporated, is thus removed. After this treatment the powder is extracted with 80 per cent. alcohol, and the solution evaporated in vacuum. The fluid residue is then triturated in portions of 500 grams with 5 liters of water acidulated with acetic acid, the insoluble portion quickly filtered off, and solid metaphosphoric acid added to the solution until no further precipitation occurs. By this procedure a considerable purification is effected, large quantities of amorphous matter, together with much jervine and rubijervine, being thrown out of solution. The voluminous precipitate is quickly removed by filtration, and to the lighter colored filtrate excess of ammonia is added, which causes no separation of protoveratrine, but a slight flocky precipitate that must also be filtered off before the solution is shaken with ether. Upon distillation of the ether the protoveratrine crystallizes out even in the distillation flask, and, separated from the light syrupy mother liquor, can be easily recrystallized out of strong alcohol, by which means traces of jervine and rubijervine are removed.

Jervine is obtained in comparatively large quantities from veratrum album, by both the baryta and metaphosphoric acid methods of extraction. In the first case the crystals which separate from the ethereal solution consist principally of jervine, while in the second method the greater part is precipitated by the metaphosphoric acid. Jervine is separated from rubijervine by Wright's and Luff's method of trituration of the crystalline mass upon the waterbath with dilute sulphuric acid. The insoluble jervine sulphate is filtered off from the aqueous solution of rubijervine sulphate, and the free base regenerated from the washed and dried product by boiling with alcohol and carbonate of sodium. Recrystallized several times out of alcohol, it is obtained in the form of satiny prismatic crystals, slightly levo-rotatory, melting point 237 to 239° C.; non-sternutatory. Sohn, "Dictionary of the Active Principles of Plants," gives the followin figures for its solubility at 22° C.; 1 in 16.8 alcohol; 60 i chloroform; 268 ether, 1,625 benzine, slightly in wat and ethyl acetate; not soluble in petroleum ether. Jervine may be removed from acid solutions by chloroform.

In 1865 Mitchell obtained jervine from veratrum viride by the following process (American Journal Pharmacy, 1874, p. 100):

The alcohol tincture is evaporated to small bulk, acidulated with acetic acid, and mixed with water. The aqueous solution is filtered, concentrated, and rendered strongly alkaline by carbonate of sodium. The precipitate is drained, dried, boiled in strong alcohol, the alcoholic solution evaporated to dryness, and digested in very dilute sulphuric acid. A granular powder, sulphate of jervine, deposits on cooling; is well washed, drained, and then boiled with strong solution of carbonate of sodium. The jervine, so liberated, is, after thorough washing, further purified by resolution in acetic acid, precipitation with ammonia, washing, and drying.



Pillton, July 2, 1897.

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THE PHARMACEUTICAL ERA

[*WEEKLY.*]

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ERA COURSE IN PHARMACY.

Some preliminary announcements and instructions for pupils who intend to join the regular classes of the ERA COURSE IN PHARMACY will be found on page 37 of this issue.

All drug clerks and druggists who intend to matriculate for this Home Study Course in Pharmacy should see that their applications are filed as soon as possible, so as to receive all the preliminary instructions to be printed in our July and August issues. The regular lectures begin with the first issue in September.

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P. O. Box 1483, New York.

Street Addresses Should be Given by Commercial Agencies.

The experiences of Mr. C. A. Voorhees, of Philadelphia, with the concern, Fraser & Co., of Greenwich street, New York, are detailed in the news pages of this issue. Mr. Voorhees is to be congratulated upon having secured payment of his account, a rather exceptional case, as the result of extended investigation shows. But he seems to have a fairly good excuse for having been led into the transaction in the first place. He complains that it is all the fault of the commercial agencies, Dun and Bradstreet. In consulting their rating books he found Fraser & Co. rated high, no street address given, and being unaware or perhaps forgetful of the fact that there are two firms of that name in this city, he shipped his goods without suspicion. But they did not go to the Fraser & Co. (of Fifth avenue), mentioned in the rating books, but to the Greenwich street concern, which is not rated at all. Mr. Voorhees claims that if the street address had been printed in the rating book he would not have been caught in this way; he blames the agencies for it and thinks they should publish the specific addresses of all houses mentioned by them.

His criticism is at once just and unjust. It is the practice of the commercial agencies to publish specific addresses in cases where there are two parties of the same name in the same line of business, but this affords little protection against the mushroom firms which may spring up in the time intervening between the issues of their reference books. To publish addresses of all would undoubtedly entail much expense in printing and much enlarge the rating books, but it would certainly be a valuable aid to the commercial world. What do Dun and Bradstreet say?

But allowing the justice of his criticism, Mr. Voorhees is not to be relieved from all responsibility. A little more care, a reading of the letterhead on which the order is sent, and, above all, perusal of the reports given in the Era with reference to this firm and the many other concerns which live by fraud, would have saved him and will save others from being trapped. A little sound advice is never to ship goods without cash payment in hand to houses of which nothing reliable is known.

When Drug Stores Were Scarce.

Now that the author of "Looking Backward" has come out with another work somewhat like that curious and fascinating story, bringing to mind again the whole subject of governmental maintenance of shops, it may be interesting to such as never heard of it before to learn that in the long-distant past apothecary shops were established at the public expense. A quarter of a century ago a writer who had investigated the subject, stated that it was supposed that an Arab physician first made use of a prescription, thus giving rise to the need of a place for the sale of medicine. Then the practice passed from Cordova and Granada into Italy, and the medical schools of Naples and Salerno brought prescriptions into use there, most of the materials of their medicines being obtained in Arabia or other Eastern points. Soon a long list of dangerous compounds was provided, and it was found necessary to pass laws restricting their sale. Then came the setting-up of shops at the expense of the people; gardens were laid out for the raising of herbs and other useful plants; laboratories were opened and distilling apparatus obtained; women of rank often presided over the preparation of the drugs, and the court apothecary was held in great esteem. It is even told that one princess maintained a drug shop at her court for the special benefit of the poor, giving away medicine and distilled water to strangers as well as to her own people. From the fifteenth century there was a rapid increase in the number of drug stores all over Europe, which, although they would appear very poor now, if contrasted with the magnificent modern drug stores, were, nevertheless, a vast improvement over those of Bagdad and Cordova. It may be worth while to mention the fact in passing that precious stones once held a high place in the list of medicines. It was, for example, supposed that an onyx would keep the whole body in good condition; coral and emeralds were looked upon as sure remedies for many ills; a topaz was believed to possess power to recreate the heart, and the loadstone, taken internally, was said to be capable of restoring one's youth.

Jubilee Enthusiasm.

Our most esteemed contemporary, the British and Colonial Druggist, of London, England, under date of June 18, published a magnificent "Special Jubilee Issue." It is certainly a credit to the publishers and would be a credit to any trade journal, and congratulations are in order and tendered. The jubilee spirit appears to enter into every feature of this issue, and the editor is, perhaps, to be pardoned for saying, "The present issue is the largest in the line of a trade newspaper ever published by any journal appealing to chemists and the drug trade. The literary contents, it will be seen, extend to over one hundred pages, and the illustrations form the most numerous collection of photographs ever published in any of the trade journals."

We must take a little friendly exception to this statement. We fear that our contemporary has in some way overlooked the Anniversary Number which the Era published on December 31, 1896. A comparison of the Jubilee issue and our own Anniversary Number shows that while the British and Colonial Druggist printed 104 pages of reading matter, the Era presented 168, and while the former offered in its reading pages 132 illustrations, the Era's credit was a total of 251, and besides this our issue numbered 40,000 copies. We think our friends may be induced to slightly modify their (excusable) jubilee boast after this explanation.

Refilling Prescriptions.

An English daily paper has proposed that the privileges granted to the Roman Catholic priest, with regard to the confidences of his flock, should be extended to the secrets of the doctor's office, and our pharmaceutical contemporaries comment upon this and urge that these privileges should be extended to the pharmacists. It is asserted that the man who puts up a prescription can have pretty nearly as full an idea of the nature of the ailment for which it is intended as has the doctor who prescribes it, and that the customer who takes a prescription to the drug store in confidence that no one will know what is his disease, is relying upon a false security. It is much to the honor of the pharmaceutical fraternity that members of it guard the confidences of their patrons, and do not disclose the secrets brought to them by way of the doctor's prescription. But there is a good deal of common sense in the suggestion brought out in the discussion of this matter that it should be made illegal for a druggist to give a copy of, or state the contents of, a prescription, without an express order from the prescriber. This is perhaps one phase of the prescription refilling question which the public might support, if it really knew the importance of the interests involved.

Dangerous W. C. T. U. Beverage.

My, oh my! The New York Sun last Friday published a dispatch from St. Louis which read thus: "There are twenty-five gaudily painted, inviting drinking fountains on as many corners, at intervals of three blocks, in the downtown districts. They are maintained by the good ladies of the Women's Christian Temperance Union. These fountains, which are of the penny-in-the-slot variety, contain what the ladies call a 'delicious, purely medicinal, healthful, non-alcoholic beverage, guaranteed harmless to the smallest child, cherry phosphate.' To-day the White Ribboners received a shock, when Dr. Felix W. Garcia, a chemist, after an analysis, publicly announced that when the phosphate is taken into the stomach the starch of the sugar in combination with other ingredients is converted into pure alcohol."

Just imagine the rush to the fountains there must have been when this intelligence was publicly announced. The W. C. T. U. must change its tipple to be consistent, if this news is true.

Nostrums and Religion.

This is hardly a case of giving the devil his due, rather the opposite of that individual is concerned, but we like to commend a good action when we learn it. The United Lutheran Conference was held at St. Paul the other day, and it is reported that one of the members caused quite a flutter in the convention by a proposition that all patent medicine advertisements be taken out of the church paper. Said he, naively, "I do not think any man could conscientiously put his name under these advertisements as true. It is hardly true that they can cure all diseases. The Hagues synod or the Norwegian synod do not allow such things to appear in their church paper, and I move that these be taken out." The motion was carried.

Let the good work go on. It would be a good thing for public health and public morality if all the religious papers would exclude advertisements of, and if ministers would stop indorsing, a certain class of disreputable and fraudulent patent medicines.

A New York paper noted for its conservativeness and carefulness made a bad mistake the other day when it printed a communication from a reader in which a warning was conveyed against the use of various drinks at the fountain said to be made from the coca leaf, kola nut, etc., urging that indulgence in this class of beverages, under the delusion that they are tonics, eventually fosters a most pernicious drug habit, leading to the use of cocaine, etc. The warning would be all right if founded upon facts and correct conclusions. But if the correspondent really knew how much (rather how little) alkaloid there is in the preparations against which he inveighs so positively, he would not have written his letter. A man would have to drink a good many gallons of the fountain drink to get even a small medicinal dose, if we are to believe analyses which have been reported. There are worse tonics which the fountain can sometimes be induced to supply.

The fun poked at Boston for its stately English seems to have a basis of fact. In the street cars of other cities a card has recently been posted, reading: "Spitting on the floor of this car is prohibited. By order of the Board of Health." In Boston a similar notice reads as follows: "The Board of Health adjudges that the deposit of sputum in street cars is a public nuisance, a source of filth, and a cause of sickness, and hereby orders that the spitting on the floors of street cars be, and hereby is, prohibited."

Easy Questions Have Been Solved.

The president of the Leland Stanford University (California) some time ago, in a magazine article, expressed the opinion that all the easy questions in science have been solved. Formerly there may have been, perhaps, real discoveries, chance happenings upon most important and valuable secrets of nature. But the discoverer of to-day cannot rely upon chance, but upon solid, hard work, patient research and investigation. The result of scientific inquiry comes as a surprise only to those ignorant of the steps of the investigation which leads up to it. He mentions a number of latter-day discoveries, showing the steps by which startling results were obtained, in support of his contention, and we must say that he makes out a very strong case, and we could bring forward no arguments in refutation.

The Early Doctor Gets the Worm.

There is usually little humor in that frequent incident in which customers leave town and forget to pay their bills, but when there is, the fact is deserving of wide publication for the benefit of the forlorn and shipwrecked brother, who, reading, shall take heart again.

Dr. F. Gundrum, of Sacramento, Cal., betrays a leaning toward that joyous spirit which puts a gloss upon adversity in a letter to Dundas Dick & Co. He says: "Your tablets acted successfully—but the patient did not. Two days after relieving him of a forty-foot worm he took the 11 p. m. train and left the State, forgetting to pay me for the medicine or my trouble. The only thing he left was the worm—and I got left, too."

The custom of storing alcohol, ether, oils and other inflammable substances in the cellars of drug stores is, perhaps, all right, or at least unavoidable. But it is the height of folly to enter these subterranean storehouses with lighted lamps, and many are the warnings which have been published in the journals against this carelessness, but so far apparently with little effect. A most distressing occurrence happened but a few days ago in Sharon, Pa., where a drug clerk was fatally burned by the explosion of a barrel of alcohol in the cellar. Just how great was the element of carelessness reports do not say, but the fact that there was a fire following the explosion showed that a light was somewhere in near proximity.

"The peach crop will be a failure" has assumed the nature and prominence of the cry of "wolf, wolf!" There is now, however, a plaint which is pushing it hard for first honors. It is "the peppermint crop will be a failure." This comes up every year with astounding regularity. We wonder whether it really will be so, and our wonder is increased by reason of another statement, that peppermint growers are considering a combine to maintain prices. If the crop is a failure, scarcity alone ought to be enough to shove prices up. Let us "await future developments."

All sorts of claims have been made relative to the value of acetylene as an illuminant, and most extravagant prophecies have been uttered. One of the first practical applications of this article as a light producer has been brought to attention by a Philadelphia drug store, which has now in working order a number of lights which employ this gas. Thus far it is said to have worked very successfully, and to give the best of satisfaction as an illuminant.

Fröken Märtha Augusta Elizabeth Leth, the 19-year-old daughter of Fredrik Bartholin Leth, of Karlshamn, Sweden, has passed an examination at the Pharmaceutical Institute at Stockholm, and is Sweden's first woman pharmacist.

SUCCESS IN PRICE RESTORATION.

A couple of weeks ago we published the information that the druggists of Carlisle, Pa., had become tired of cut-rate patent medicines, and had agreed to restore rates. One of these druggists, Mr. George W. Sipe, was pleased with our remarks, and gives us a little fuller details of the plan which is now in successful operation in his town. He says:

"We have been just one week now at the business of restoring prices. And I will say, as do all the others, that we are surprised that there is not more kicking in general. We have a few customers who say they will buy out of town, but they all come back, and the majority of them say that they are glad it is over, for now they are sure of getting purer drugs. But I will say this town of ten thousand and over was never imposed upon in the way of impure and old drugs, even at cut rates. Find inclosed one of the original copies of agreement, and I only hope that it will be of benefit to others of the craft, for I know, as well as others, that it is not very pleasant to work from 6 a. m. to 10 p. m. and find you have made only $1.00. A laboring man can make more than we by working only eight hours. Sunday, the Fourth of July, we shall close our stores all day, excepting one hour in the morning, from 9 to 10. As the iron was hot we thought that that could be thrown in, and I was surprised that all of the druggists have taken hold of it so readily."

Here follows the agreement drawn up and signed by all the druggists in the town, and it is offered in the hope that it may be of service to druggists in other localities which are similarly afflicted:

The undersigned herby individually and jointly agree that we and each of us, our employés and any one acting for us, will sell proprietary goods, includng so-called patent medicines and whatever is exclusively put up in definite packages and controlled by single individuals or firms, whether in solid, liquid or other form, only at full retail prices, which prices shall be those published in "The Chas. N. Crittenton Co. Catalogue of Proprietary Medicines and Druggists' Sundries," "1895-1896"—and when not herein published, at an advance of fifty per cent. on the regular published one dozen wholesale cost price of the article, provided that if such retail price shall approximate to fifteen, twenty, twenty-five, thirty-five, fifty, seventy-five, one dollar and so forth, that these shall be the retail selling prices (not such prices as 23c., 32c., 48c., etc.). The following articles only are to be considered exceptions to this, and these articles are to be sold at not less than the prices named herein, viz.: Hood's Sarsaparilla, 80 cents; Paine's Celery Compound, 80 cents; Warner's Safe Cure, $1.10; Pinkham's Vegetable Compound, 80 cents; Green's Nervura, 80 cents; Scott's Emulsion, large, 80 cents; small, 45 cents; Kilmer's Swamp-Root, large, 80 cents; small, 40 cents; Miles' Nervine, 80 cents; Ayer's (J. C. & Co.) one dollar articles, each 80 cents; Fellows' Hypophosphites, $1.20; Hall's Hair Renewer, 80 cents; Seven Sisters Hair Grower, large, 80 cents; small, 40 cents; Green's August Flower, 60 cents; Hall's Catarrh Cure, 60 cents; Jayne's Expectorant, 80 cents; Sozodont, 65 cents; Malted Milk (hospital size), $3.35; one dollar size, 80 cents; Malted Milk (fifty cent) 40 cents; Mellin's Food, large, 65 cents; small 40 cents; Hubbell's Wheat, 40 cents; Condensed Milk, Eagle Brand, 20 cents; Doan's Kidney Pills and Ointment, each 40 cents; Williams' Pink Pills, 40 cents; Syrup of Figs (fifty cent), 40 cents.

The following articles are to be sold at not less than 20 cents each: Ayer's Pills, Schenck's Pills, Carter's Little Liver Pills, Miles' Nerve and Liver Pills, Munyon's (twenty-five cent sizes) Remedies, Wright's Indian Vegetable Pills, Cuticura Soap, Winslow's Soothing Syrup, Phenyo-Caffeine Pills, Piso's Cure, Pierce's Pleasant Purgative Pellets, Paragon Tea, Lane's Tea, Garfield Tea; Weaver's Alpine Tea, at 15 cents per package, two packages for 25 cents.

The following articles at not less than prices named: Pierce's (one dollar) Remedies, 80 cents; Pond's Extract (fifty cents) 40 cents; Allcock's Porous Plasters, 15 cents, or two for 25 cents; Benson's Capcine Plasters, 20 cents. All other regular size porous plasters, under names of S. & J., J. & J., J. Ellwood Lee & Co., Bauer & Black, 20 cents; Johann Hoff's Malt Extract, 35 cents; Johann Hoff's Malt Extract with Iron, 40 cents; One-grain Quinine Pills, not less than 10 cents a dozen; Two-grain Quinine Pills, not less than 10 cents a dozen; Three-grain Quinine Pills, not less than 15 cents a dozen; Five-grain Quinine Pills, not less than 20 cents a dozen; these prices of Quinine Pills for one dozen or less.

We further agree that we will make no abatement on these prices whatever to any one whomsoever, be he friend or foe, except: First, to physicians, to whom an abatement of not more than fifteen per cent. will be allowed on full retail prices, no discount on the cut prices; second, to ministers of the Gospel, regularly serving congregations in the town and neighborhood (to none others), ten per cent. likewise; third, to blood relatives, optional prices. To all other persons we will sell in half dozen lots only, six single packages at the aggregate price of five packages, provided that the prices of the article in half dozen lots shall not be less than the aggregate price of five single packages at full regular retail prices, unless otherwise specified by the manufacturer of the article in question. We further agree that we will make no abatement to country store-keepers or dealers on regular full retail prices on purchases of any less quantity than quarter-dozen lots, in which case the abatement will be twenty per cent., and in half-dozen lots or more, not over twenty-five per cent.; and to store-keepers in Carlisle we will make no abatements.

We further agree that the taking or giving of tickets or pictures will be optional, but that in no case shall money or goods as a cash equivalent be given to the customer or any cash value be assigned to the tickets or pictures so given or taken.

We further agree that this article of agreement shall remain in force and be binding on all the undersigned until July 1, 1898, unless annulled or modified by the unanimous consent of all subscribers hereto.

We further agree that there shall be made as many copies of this agreement as there are subscribers to it, and that each such copy shall be signed by all the subscribers and shall have the force and be considered as an original article of agreement, that each of us will make oath before a Notary Public "that this is our voluntary act and deed, and that we will abide by it so long as it shall continue in force as herein provided, and that in case of a violation of this agreement on the part of any one hereto subscribing that he hereby, for value received, the receipt of which he hereby acknowledges, confesses judgment in the sum of one hundred dollars to the other subscribers hereto, and that he hereby waives the right of appeal and all benefit of exemption laws, and stay of execution, and authorizes any attorney at law or Justice of the Peace on the evidence of three witnesses establishing the fact of the violation of this agreement to confess judgment against him, to collect the amount of the same, and, after deducting costs, to divide the balance among the other subscribers hereto.

This agreement to go into effect on the 21st day of June, 1897.

An anxious correspondent who is too bashful to sign his name sends a postal card worded, "Would you kindly inform me why you do not publish anything from the New York City Board of Pharmacy, as all the other journals do." If this timid individual would carefully read this journal he would know that every meeting of the board for examination is reported. Sign your name and address next time.

There must be some truth in the charge that a certain class of druggists show no disinclination toward figuring as saloon keepers, for we find it gravely noted by a Topeka, Kan., paper that there is in that city a drug store in which a slot machine is arranged to supply bottled beer. The future of pharmacy may well occasion concern if such proceedings as this threaten to become at all general.

A small town out in Oregon wants to raise money for a sinking fund to meet its bonded indebtedness, and among other means it has decided to levy a tax on all business houses and professional men. Druggists are to contribute $25 annually. This class of merchants is, however, not alone in the indignant protests which are arising against the measure.

Georgia means to have good food and drugs and reliable, competent medicine dispensers. The Pharmacy Board and the Health Board are actively working in this direction. Prosecutions of unregistered drug clerks are frequent, and the Board of Pharmacy is making a thorough canvass of the State to see that there is no illegal business. A $50 fine is imposed on offenders.

The U. S. Geological Survey has figured up some of the mineral productions of the United States for 1896 as follows: Antimony, 601 tons, valued at $84,290; aluminum, 1,300,000 pounds, $520,000; mineral waters, 21,668,345 gallons sold, $4,005,668; borax, 13,508,000 pounds, $675,400; bromine, 546,580 pounds, $144,501; sulphur, 5,260 tons, $87,200; Fuller's Earth, 9,872 tons, $59,360.

Astonishing.

He.—I am really surprised at Dr. White. After being our family doctor for years, and treating me for all sorts of things, and to think of all the money we've paid him, too!

She.—What has he done?

He.—He wouldn't pass me for the life insurance company!—Boston Medical and Surgical Journal.

NOBEL PRIZES FOR SCIENTIFIC DISCOVERIES.—U. S. Minister Ferguson writes from Stockholm, to the State Department, under date of May 7, 1897:

I inclose an extract from the will of Alfred Nobel, which was published in the Stockholm Nya Dagligt Allehanda, on Jan. 2, 1897, relating to his bequest for prizes. The will was dated Paris, Nov. 27, 1895, and after disposing of about 2,000,000 kronor in legacies to relatives, servants, etc., directs that the remainder be devoted to the objects set forth in the extract which I inclose. The amount thus devoted to the advancement of science and literature is estimated to be between 30,000,000 and 35,000,000 kronor and it is thought that it will yield 3 per cent. per annum income, or from $240,000 to $270,000 to be annually distributed in five prizes. Each individual prize will therefore be worth between $48,000 and $55,000.

Messrs. Ragnar Sohlman, of Bofors, Sweden, and Rudolf Liljequist, of Stockholm, Sweden, who now resides at Bengtsfors, Uddevalla, are named executors. I have written to them for information, which I will transmit when received. I have also written to the vice-consul at Christiania to ask him to transmit to the Department direct a copy of the communication made by the executors to the Storthing informing it of the bequest.

I understand that several of the heirs at law of Mr. Nobel are contesting the will and that it may possibly be years before the executors will be able to distribute the prizes.

As I receive a great many letters from students and investigators from all parts of the United States making inquiry as to the distribution of the prizes, and as the munificent bequest of Mr. Nobel has created a very widespread interest, I would respectfully suggest that the information I send from time to time be given to the press:

(Translation.)

My total remaining fortune, when capitalized, shall be disposed of in the following way: When the capital has been converted into good securities by the trustees, it shall form a fund, the interest of which shall be distributed annually as prizes to those persons who shall have rendered humanity the best services during the past year. The interest shall be divided into five equal portions, which shall be distributed as follows: One-fifth to the person having made the most important discovery or invention in the science of physics, one-fifth to the person who has made the most eminent discovery or improvement in chemistry, one-fifth to the one having made the most important discovery with regard to physiology or medicine, one-fifth to the person who has produced the most distinguished idealistic work of literature, and one-fifth to the person who has worked the most or best for advancing the fraternization of all nations and for abolishing or diminishing the standing armies as well as for the forming or propagation of committees of peace. The prizes for physics and chemistry shall be awarded by the Royal Swedish Academy of Science; that given to works of physiology and medicine, by the Carolinska Institute at Stockholm; the prize for literature, by the Royal Swedish Academy at Stockholm, and the prize given to the propagators of peace, by a committee composed of five members, who shall be selected by the Norwegian Storthing. It is my absolute wish that no importance shall be attached to any difference of nationality in awarding the prizes, which, consequently, shall be given to the most competent person, whether Scandinavian or not.

CHRISTIAN SCIENCE.—The young seamstress, who is a thorough convert to "Christian Science," made her appearance with a violent influenza, when her employer exclaimed:

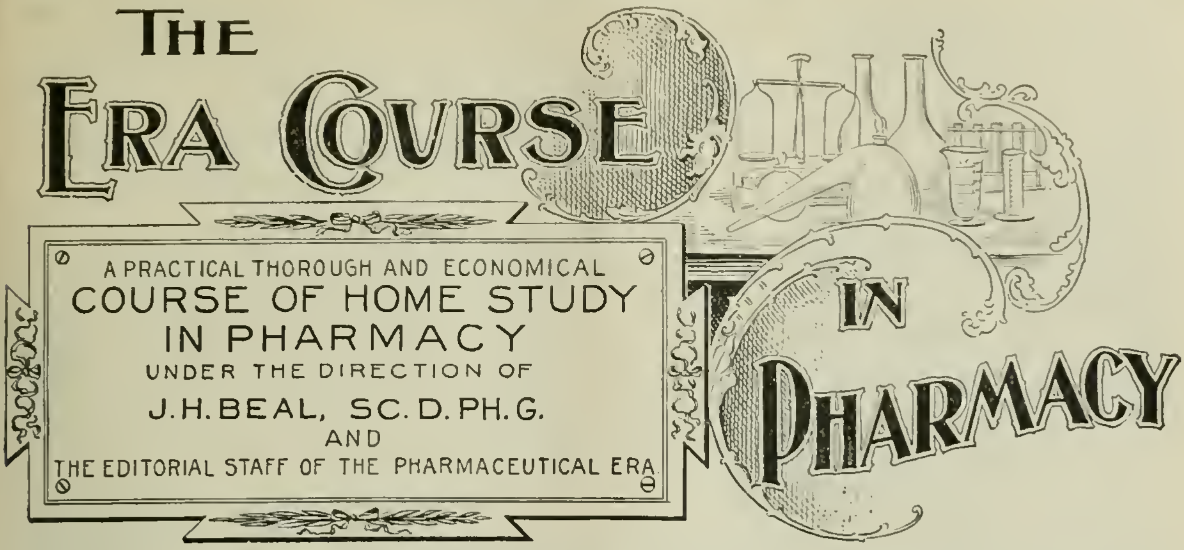
"Why, Mary, where did you get that cold?"

"Oh, I haven't a cold m'am," said Mary.

"It's absurd for you to say that you haven't a cold when you know that you have."

"Well, ma'am," said Mary, with some hesitation, "I know I haven't got a cold, but—but I'm threatened with a belief that I have one."—Drug Topics.

ALCOHOL "Pasteurisé."—An alcohol free from fusel oil.



THE ERA COURSE IN PHARMACY

A PRACTICAL THOROUGH AND ECONOMICAL
COURSE OF HOME STUDY
IN PHARMACY
UNDER THE DIRECTION OF
J. H. BEAL, SC. D. PH. G.
AND
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ADDITIONAL ANNOUNCEMENT OF SPECIAL TOPICS.

In addition to those previously announced we print below a further installment of the Special Topics which have been selected as subjects for discussion in the forthcoming Era Course in Pharmacy.

Some of the indicated titles pertain strictly to the scientific and professional aspect of pharamcy, while others relate almost exclusively to its commercial side. All, however, are of practical importance to every one connected with the retail drug business.

Since some of the topics named have long been the subject of debate among pharmacists, it may be questioned why they should have been admitted to the present list. One reason is that their discussion has too frequently been conducted in a controversial rather than a judicial spirit, and by authors intent upon establishing one or the other opinion. In the present series it is hoped that such subjects will be discussed from a wholly unbiased standpoint, and with the single design of establishing and demonstrating the truth, whether the result reached be pleasant or unpleasant. It is believed that there is a right way and a wrong way of conducting even such a prosaic matter as the cigar case, and that as long as the latter is recognized as a legitimate part of the drug business, it should be the business of the druggist to be fully informed upon it. Moreover, it is anticipated that these lectures will be perused by those who are now forming the sentiments which will determine their future usefulness or harmfulness to pharmacy. It is therefore of importance that these should have upon such weighty matters the opinions of those whose maturity and abundance of experience enable them to speak with authority.

In the case of a few of the suggested topics it may perhaps be regretted that the conditions of dispensing pharmacy at the present time make their consideration necessary; but though we may regret the necessity, it would be unwise to ignore it. The better way is to submit them to candid discussion, hoping thereby to aid in the creation and dissemination of such opinions as will hasten the day of better things.

It is expected that other titles will be announced from time to time.

The Drug Store Cellar.

Its Contents and Arrangement.

The Prescription File.

How to Care for and Preserve Prescriptions.

Invoicing a Drug Stock.

Methods involving the least delay and disturbance of business.

Homeopathic Pharmacy.

Dispensing to the Homeopathic Trade.

Druggist's Side Lines.

A systematic review of the general subject of "side lines," and of the proper and improper adjuncts to dispensing pharmacy.

The Perfume Case.

The selection, care and sale of the perfume stock.

Patents and Proprietaries.

The general policy to be pursued with regard to the patent and proprietary medicine business.

The Pharmacist and the Physician.

A consideration of Medico-Pharmaceutical Ethics, and of the relations of pharmacist and physician.

Advertising the Drug Store.

A critical discussion of the advertising problem, of profitable and unprofitable, proper and improper methods of securing publicity.

Pharmaceutical Toxicology.

What the pharmacist should know about poisons. A concise account and classification of the leading mineral and organic poisons, their mode of action, and the emergency treatment of cases of poisoning.

What to Do in Emergencies.

The aid to be rendered by the pharmacist in cases of injuries and sudden illness. before the arrival of medical attendance.

Infant Foods and Dietetic Articles for the Sick Room.

A careful review of this important class of articles, their selection and care. The extemporaneous preparation by the druggist of dietetic articles for infants, and for the sick room.

Druggists Glassware.

A critical study of the glassware of the drug store, from shelf furniture to prescription bottles. The most suitable and economical styles. Selection and storing of prescription ware, etc.

Jobber and Retailer.

Their reciprocal rights and duties. Two papers: one by a wholesaler and one by a retailer.

The Soda and Mineral Water Trade.

A general discussion of the management of the soda and mineral water department of the drug store.

Window Dressing and Display.

The correct principles of display as applied to the drug store window, and the general stock.

The Toilet Soap Stock.

How to select, preserve and sell toilet soaps.

Spices and Flavoring Extracts.

How to create and maintain patronage for these articles.

The Adulteration of Powdered Drugs.

The common adulterants of powdered drugs and how to detect them.

The Brush Stock.

The selection, care and display of the tooth, hair and cloth brush stock.

The Sponge Basket.

How to buy, preserve and sell sponges.

The Poison Closet.

A system of keeping and dispensing poisons.

Posology.

A brief treatise on the dosing of medicines. How to learn and how to remember doses.

The Sale of Narcotics, and of Articles Intended for Improper or Immoral Purposes.

A discussion of the pharmacist's moral obligations to the State and public.

FOREIGN RATES.—In reply to numerous inquiries we would state that the Era Course will be found particularly adapted to the wants of students in England and other foreign countries. The cost (increased because of the greater postage) to such students will be:

One year's subscription to Era........	$4.00
Class fees (two terms) one year	6.00

Making a total of $10 per year for the full course.

REQUIREMENTS FOR MATRICULATION.—The only requirements are that each student shall be a subscriber to the Era in his own name and his subscription paid in advance for one year; in addition to this there is a tuition fee of $4.00 per annum, payable in advance. This makes a total expense of only $7.00 for forty weeks of systematic instruction, including quizzes and examinations by mail. The price is so low that our friends will please not ask us to make any exceptions to these requirements or terms.

BOOKS FOR THE ERA COURSE.

Very many intending students of this course have asked our advice relative to the books with which they should be supplied to most efficiently supplement the lectures. This general answer can be made to fit individual cases, replying to all inquiries of this nature.

At the outset it may be said that the student cannot have too many good books, but at the same time he can get along with but few. The main thing is to know how to use his books. Reading should be after some definite system, with some plain purpose in view. Desultory, unsystematic reference to books serves merely to load the mind with a lot of individual, unconnected, unrelated facts.

It is expected that the various lecturers will give all necessary advice regarding the choice of special works in connection with their subjects. But the student should have at least one good work on each of the main branches making up the science of pharmacy. These books will be of every-day service through the whole of the druggist's business life, and he cannot have too complete a working library. So our advice to students is to purchase as many standard, good books as they can afford.

The following list has been carefully compiled. It is not intended that one shall purchase all of the works named, but the leading books on each subject are named so that choice can be made at one's pleasure. Nor is it to be understood that this list embraces all the good books, though it is believed to be fairly comprehensive and representative.

The student should have the following:

U. S. Pharmacopœia.

Dispensatory (United States or National).

These will be useful, even indispensable, in the study of all the branches treated in the course.

From the following list he should select, if possible, one good work in each division:

GENERAL REFERENCE WORKS.

Stille, Maisch and Caspari. National Dispensatory. New 5th edition. Revised according to the Seventh Decennial Revision of the U. S. Pharmacopœia. Imperial 8vo., 2,205 pages. Full sheep, $8. Philadelphia: Lea Bros. & Co.

United States Pharmacopœia. Seventh Decennial Revision, 1894. 8vo. Cloth, $2.50 (post paid, $2.77).

Wood, Remington & Sadtler. United States Dispensatory. New 17th edition. Based on the Pharmacopœia of 1893. Royal 8vo., 1,930 pages. Full sheep, $8. Philadelphia: J. B. Lippincott Company.

GENERAL CHEMISTRY.

Attfield. Manual of General, Medical and Pharmaceutical Chemistry. 14th edition. 12mo., 794 pages, 88 illustrations. Cloth, $2.75. Philadelphia: Lea Bros. & Co.

Bartley. Medical and Pharmaceutical Chemistry. 4th edition. Revised and enlarged, 12mo., illustrated. Cloth, $2.75. Philadelphia: P. Blakiston, Son & Co.

Bloxam. Chemistry, Inorganic and Organic. Fifth American from 5th English edition. 8vo., 727 pages, 292 illustrations. Cloth, $2. Philadelphia: Lea Bros. & Co.

Clowes. Elementary Chemistry. Third American edition. 12mo., 387 pages, 55 illustrations. Cloth, $2.50. Philadelphia: Lea Bros. & Co.

Fownes' Chemistry. 12th edition with Watts' Inorganic Chemistry. 12mo., 1,061 pages, colored plate and 168 illustrations. Cloth, $2.75. Philadelphia: Lea Bros. & Co.

Mendeléef. The Principles of Chemistry. 2 vols., illustrated, 8vo. Cloth, $10. New York: Longmans, Green & Co.

Remsen. Introduction to the Study of Chemistry. Revised edition. 12mo., 435 pages. Cloth, $1.12. New York: Henry Holt & Co.

Remsen. Theoretical Chemistry. New 5th edition. 12mo., 326 pages. Cloth, $2. Philadelphia: Lea Bros. & Co.

Richter. Inorganic Chemistry. Fourth American, from the sixth German edition. 89 illustrations and colored plate of spectra, 12mo. Cloth, $1.75. Philadelphia: P. Blakiston, Son & Co.

Richter. Chemistry of the Carbon Compounds or Organic Chemistry. Second American, from 6th German edition. Illustrated, 12mo. Cloth, $4.50. Philadelphia: P. Blakiston, Son & Co.

Roscoe and Schorlemmer. Treatise on Chemistry. Illustrated.

Inorganic Chemistry, 8vo., Vol. I.—Non-metallic Elements, $5. Vol. II., Part I.—Metals, $3. Vol. II., Part II.—Metals, $3.

Organic Chemistry. 8vo. Vol. III., Part I.—Chemistry of the Hydrocarbons and Their Derivatives, $5. Vol. III., Part II.—The Same, $5. Vol. III., Part III.—The Same, $3. Vol. III., Part IV.—The Same, $3. Vol. III., Part V. —The Same, $3. Vol III., Part VI.—The Same, $3. New York: D. Appleton & Co.

Sadtler and Trimble. Text Book of Chemistry. 8vo., 950 pages. Cloth, $5. Philadelphia: J. B. Lippincott Co.

Simon. Manual of Chemistry. New 5th edition. 8vo., 502 pages, 44 engravings and 8 plates, illustrating colors of 64 important tests. Cloth, $3.25. Philadelphia: Lea Bros. & Co.

Wulling. Elementary Course in Inorganic Pharmaceutical and Medical Chemistry. 12mo. Cloth, $2. New York: John Wiley & Sons.

CHEMISTRY, INORGANIC.

Jago. Introduction to Practical Inorganic Chemistry; or, The Principles of Analysis. 12mo., 80 pages. Cloth, 45 cents. New York: Longmans, Green & Co.

Jago. Inorganic Chemistry, Theoretical and Practical. 78 wood cuts and colored plate of spectra. 12mo., 470 pages. Cloth, $1.50. New York: Longmans, Green & Co.

Newth. Text-Book of Inorganic Chemistry. Second edition. 146 illustrations, crown 8vo. Cloth, $1.75. New York: Longmans, Green & Co.

Remsen. Inorganic Chemistry. Revised edition. 872 pages, 8vo. Cloth, $2.80. New York: Henry Holt & Co.

QUALITATIVE ANALYSIS.

Curtman. Lessons in Analysis, Qualitative and Volumetric. 4th edition. Revised and enlarged, 295 pages. Cloth, $1.25. St. Louis:

Noyes. Elements of Qualitative Analysis. 8vo., 91 pages. Cloth, $4.50. Philadelphia: P. Blakiston, Son & Co.

Prescott and Johnson. Qualitative Chemical Analysis. A Guide in the Practical Study of Chemistry. Fourth edition. 8vo. Cloth, $3.50. New York: D. Van Nostrand Company:

Trimble. Practical and Analytical Chemistry. Fourth edition. Illustrated, 8vo. Cloth, $1.50. Philadelphia: P. Blakiston, Son & Co.

QUANTITATIVE ANALYSIS.

Curtman. Chemical Reagents. Their Purity and Preparation. 8vo., 256 pages. Cloth, $1.75. St. Louis:

Hartley. Course of Quantitative Analysis for Students. 12mo. Cloth, $1.25. New York: The Macmillan Company.

Hoffman and Power. Manual of Chemical Analysis. Third edition. 8vo., 621 pages, 179 illustrations. Cloth, $4.25. Philadelphia: Lea Bros. & Co.

Lyons. Pharmaceutical Assaying. 12mo., 154 pages. Cloth, $1.25. New York: D. O. Haynes & Co.

Schimpf. Text-Book of Volumetric Analysis. 12mo., 400 pages. Cloth, $2.75. New York: John Wiley & Sons.

Sutton. Volumetric Analysis. Seventh edition. Illustrated. Cloth, $4.50. Philadelphia: P. Blakiston, Son & Co.

PHARMACY.

Caspari. Treatise on Pharmacy. 8vo., 680 pages, 288 illustrations. Cloth, $4.50. Philadelphia: Lea Bros. & Co.

Coblentz. Handbook of Pharmacy. Second edition. Revised and enlarged. 572 pages, 437 illustrations, 8vo. Cloth, $4. Philadelphia: P. Blakiston, Son & Co.

Heebner. Manual of Pharmacy and Pharmaceutical Chemistry. Fourth edition. 12mo., 252 pages. Cloth, $2. New York: Published by the author.

Oldberg. Home Study of Pharmacy. Second revised edition. 8vo., 571 pages, 150 illustrations. Cloth, $3. Chicago: W. T. Keener Co.

Remington. Practice of Pharmacy. Third edition. 8vo., 1,448 pages, 600 illustrations. Cloth, $6. Philadelphia: J. B. Lippincott Co.

Stewart. Compend of Pharmacy. Fifth edition. 12mo. Cloth, 80 cents; interleaved, $1.25. Philadelphia: P. Blakiston, Son & Co.

BOTANY.

Bastin. College Botany. Second Revision. 8vo., 451 pages, 600 illustrations. Cloth, $2.50. Chicago: G. P. Engelhard & Company.

Bessey. Botany. Revised edition. 8vo., 611 pages. Cloth, $2.20 net. New York: Henry Holt & Company.

Gray. Lessons in Botany. 12mo., 226 pages. Cloth, 95 cents. New York: American Book Company.

Vines. Student's Text-Book of Botany. Complete in one volume. 8vo. Cloth, $3.75. New York: The Macmillan Company.

MATERIA MEDICA, THERAPEUTICS AND PHARMACOGNOSY.

Bartholow. Treatise on Materia Medica and Therapeutics. Ninth edition. 8vo. Cloth, $5. New York: D. Appleton & Co.

Farquharson. Therapeutics. Fourth American from fourth English edition, revised by Frank Woodbury, M. D., with additions embracing the U. S. Pharmacopœia. 12mo., 551 pages. Cloth, $2.50. Philadelphia: Lea Bros. & Co.

Culbreth. Manual of Materia Medica and Pharmacology. 8vo. 818 pages, 455 illustrations. Cloth, $4.75. Philadelphia, Lea Bros. & Co.

Flückiger and Tschirch. Principles of Pharmacognosy. Translated by Power. 8vo., 291 pages, 186 illustrations. Cloth, $3. New York: Wm. Wood & Co.

Maisch. Manual of Organic Materia Medica. New 6th edition. 12mo., 509 pages, 285 illustrations. Cloth, $3. Philadelphia: Lea Bros. & Co.

Potter. Handbook of Materia Medica, Pharmacy and Therapeutics. Sixth edition. 8vo. Cloth, $4.50. Philadelphia: P. Blakiston, Son & Co.

Rusby and Jelliffe. Essentials of Vegetable Pharmacognosy. 8vo., 149 pages, 560 illustrations. Cloth, $2.50. New York: D. O. Haynes & Co.

Sayre. Organic Materia Medica and Pharmacognosy. 8vo., 555 pages, 543 illustrations. Cloth, $4. Philadelphia: P. Blakiston, Son & Co.

Wall. Notes on Pharmacognosy. 12mo. Cloth, $1.50. St. Louis: Meyer Bros. Drug Company.

White and Wilcox. Materia Medica, Pharmacy, Pharmacology and Therapeutics. Second edition. 12mo., 660 pages. Cloth, $3. Philadelphia: P. Blakiston, Son & Co.

BACTERIOLOGY.

Hueppe. Methods of Bacteriological Investigation. 8vo., 218 pages, 31 illustrations. Cloth, $2.50. New York: D. Appleton & Co.
New York: D. Appleton & Co.

Schenk. Manual of Bacteriology. Translated from the German by W. R. Dawson, B. A., M. D. 100 ilustrations, 8vo. Cloth, $3. New York: Longmans, Green & Co.

CHEMICAL ARITHMETIC, METROLOGY, ETC·

Beal. Notes on Equation Writing and Chemical Arithmetic. 12mo., 94 pages. Cloth, 75 cents. New York: D. O. Haynes & Co.

Oldberg. Pharmaceutical Problems and Exercises. Third edition. 12mo. Cloth, $1.50 net. Chicago: W. T. Keener Co.

Oldberg. Weights and Measures. Fourth edition. 12mo., illustrated. Cloth, $2 net. Chicago: W. T. Keener Co.

Stammer. Chemical Problems. 12mo. Cloth, 50 cents. Philadelphia: P. Blakiston, Son & Co.

URINALYSIS.

Flint. Manual of Chemical Examination of the Urine. Fifth edition. 12mo., 77 pages. Cloth, $1.00. New York: D. Appleton & Co.

Hofman and Ultzmann. Analysis of the Urine. Third edition. 8vo., 310 pages, 8 lithographic plates. Cloth, $2. New York: D. Appleton & Co.

Jennings. Practical Urine Testing. 12mo., 124 pages. Cloth, $1. New York: D. O. Haynes & Co.

Tyson. Guide to the Examination of Urine. Ninth edition. 12mo. Cloth, $1.25. Philadelphia: P. Blakiston & Co.

MISCELLANEOUS.

Art of Dispensing. A Treatise on the Methods and Processes Involved in Compounding Medical Prescriptions. Fifth edition. 280 pages. Cloth, $1.50. London.

Chapman. Human Physiology. 8vo., 925 pages, 605 engravings. Cloth, $5.50. Philadelphia: Lea Bros. & Co.

Draper. Medical Physics. 8vo., 734 pages. 376 illustrations. Cloth, $4. Philadelphia: Lea Bros. & Co.

Dunglison. Dictionary of Medical Science. 21st edition, with appendix. 8 vo., 1,225 pages. Cloth, $7. Philadelphia, Lea Bros. & Co.

Flint. Text-Book of Human Physiology. Fourth edition, 8vo., 872 pages, 316 engravings. Cloth, $6. New York: D. Appleton & Co.

Fock. An Introduction to Chemical Crystallography. Translated by Pope. 12mo., 189 pages. Cloth, $1.40. New York: The Macmillan Co.

Gage. Microscope and Microscopical Methods. Fifth edition. 8vo., 103 figures. interleaved. Cloth, $1.50. Ithaca: Comstock Publishing Co.

Gerrish. Prescription Writing. Sixth edition. 55 pages. Cloth, 50 cents. Portland: Loring, Short and Harmon.

Gould. Medical Student's Dictionary. Small 8vo., 520 pages. Half dark leather, $2.75. Philadelphia: P. Blakiston, Son & Co.

Lippincott's Medical Dictionary. By Greene, Piersol, Ashhurst and Remington. 8vo., 1,160 pages. Cloth, $7. Philadelphia: J. B. Lippincott Co.

Martin. The Human Body. Briefer Course. 377 pages, 12mo. Cloth, $1.50. New York: Henry Holt & Co.

Robinson. Latin Grammar of Pharmacy and Medicine. Second edition. 277 pages. Cloth, $1.75. Philadelphia: P. Blakiston, Son & Co.

Schafer. Essentials of Histology. 8vo., 311 pages, 288 illustrations. Cloth, $3. Philadelphia, Lea Bros. & Co.

Scoville. Art of Compounding. 8vo., 264 pages. Cloth. Philadelphia: P. Blakiston, Son & Co.

Thompson. Practical Dispensing for Students. Second edition. 12mo., 87 pages. Cloth, 75 cents. London.

Wall. The Prescription. Second revised edition. 12mo., 206 pages. Cloth, $1.50. St. Louis: Aug. Gast Bank Note & Litho. Co.

Williams. Elements of Crystallography. Revised edition. 12mo., 270 pages. Cloth, $1.25. New York, Henry Holt & Co.

Zimmerman's Botanical Microtechnique. Translated by J. E. Humphrey. 296 pages, 8vo. Cloth, $2.50. New York: Henry Holt & Co.

QUESTIONS ANSWERED.

The publishers of the Era Course will be glad to answer questions addressed to them upon all matters about which intending matriculates may find themselves in doubt.

The lectures of the Era Course in Pharmacy will begin with the first issue of the Pharmaceutical Era in September. In conducting the recitations, the questions will be sent out each week in the order of the matriculations, so that those who stand earliest on the record will be the first to receive their recitation blanks. This will give to such students the advantage of a longer time in which to prepare their recitations before receiving the next lecture.

For these reasons intending students should take out their matriculation cards as soon as possible, so as to have all the preliminary blanks at hand and to be ready to begin work promptly with the appearance of the first lecture.

KEEPING UP WITH THE LECTURES.

One of the most important elements of success in pursuing this or any similar course of study is to keep pace with the regular exercises. A prime advantage of such a course over self directed study is in the system and regularity which it enables the student to bring to his work. Much of this advantage will be lost by the frequent skipping of lectures or recitations.

Occasionally, however, a student may unavoidably be compelled to make a break in his studies. In such a case the question may arise whether he should continue with the advanced work, or first make up the lectures in arrears. The answer to this question will depend somewhat upon the particular circumstances. Where the subject is so connected that a knowledge of what has preceded is essential to the understanding of what is to follow it is, of course, necessary to first make up the preliminary work. Generally, however, the student will find it advantageous to prepare the later lectures first and then bestow any remaining time he may have upon making up arrearages.

FORM LOCAL CLASSES.

In localities where two or more students take the work, they would find it very advantageous to form themselves into classes to meet regularly for the study of the lectures and to hold their own quizzes and examinations. In this way enthusiasm is sustained and a more thorough mastery of the work accomplished.

R. L. Lynch, Phar. D., M. D., Washington, D. C.—I heartily indorse the proposed Era Course in Pharmacy. Many prospective applicants for examination before the District of Columbia Board of Pharmacy have come to me with the request that I furnish them with a list of text books, the study of which might make them reasonably certain of passing the examination. The Era Course would undoubtedly be just the thing, and I would suggest that it is the duty of every pharmacist to furnish his store library with the lectures, if he is at all interested in the apprentice whom he employs at phenomenally low wages, with the avowed purpose of teaching him the drug business.

* * *

E. B. Heimstreet, Janesville, Wis.—I am fully in sympathy with this move of yours, and think it will be of great benefit, not only to many of the young men who are preparing for their examination, but we, the older pharmacists, can gather a good deal of information. I trust you will meet with success in this project.

(Special London Correspondence.)

THE CHEMISTS' ASSISTANTS' ASSOCIATION.

Assistants to London chemists do not get a great amount of spare time, but once weekly, from the beginning of October until the middle of May, the members of this association meet on Thursday evenings to have a friendly chat and to hear a paper on some topic of general or pharmaceutical interest.

The Reasons for its Existence

are succinctly given in the first of the association's rules, viz:

> "The objects of this association shall be the promotion of intercourse among chemists' assistants, and the discussion of subjects tending to the welfare of all interested in pharmacy,"

and the manner in which the work has been carried out during the twenty years of its existence has met with the approbation and support of all the leading pharmacists in London.

Frank A. Rogers. *F. W. Hill. Ph. C.* *T. A. Ellwood. M.R C.S.*

C. Morley, Ph. C. *E. F. Harrison, B.Sc., F.C.S.*

The association was formed in 1877 by a number of assistants, with the help of their employers and the pecuniary assistance of several firms, and continues its work much in the same way as it begun, the general endeavor of the majority of members being to carry out the provisions of the rule cited above without letting any spirit of trade unionism into their midst. The members realize that although for the period of their membership they are only assistants, yet in a few years' time they hope to be employers, and consequently the grievances of a few are not allowed to urge the association into any line of action which is not of real benefit. The discussions that take place at some of the meetings and the resolutions which are passed generally gain the consideration of the Council of the Pharmaceutical Society, and have been productive of good on more than one occasion. This attitude accounts in part for the support which the association receives from employers and the wholesale firms.

The affairs of the association are guided by a council of fourteen members, who choose the officers from amongst themselves. These are: The president, two vice-presidents, treasurer and two secretaries, and either post of honor entails a considerable expenditure of time and trouble. The programme for the session is arranged by the secretaries, after the approval of the council, and consists of a number of evenings devoted to the reading of papers, several musical and social evenings, a conversazione and dance and a dinner.

The papers read at the meetings are of considerable value to pharmacy, and comprise work by men of high scientific standing, as well as the members' own productions. The trade newspapers find it worth while to report all the meetings, and the papers so published are frequently reprinted in the Era and other foreign contemporaries.

The social evenings generally attract a good attendance, but the largest gatherings are the annual conversazione and dance and the dinner, at both of which functions employers are present in almost as large numbers as the members.

In addition to the members of the association there are fifty patrons, and the list of these is made up of the best known chemists and scientists in the kingdom. They pay a subscription of half a guinea, but the members pay five shillings only, which covers everything except the ticket for the annual dinner. The patrons take a lively interest in the association, and frequently one or other takes the chair at a social gathering. Two gentlemen who were always given a hearty reception in this capacity were Mr. Silas M. Burroughs and Mr. Alfred H. Mason, and London assistants were always sure of a good evening when either of these now deceased gentlemen presided.

In connection with the association two prizes are offered annually, one for "Practical Work" and one for an "Essay" on some pharmaceutical topic. Each prize consists of the association's silver medal and £5, together with a copy of Remington's Practice of Pharmacy, which two latter are given by Messrs. Burroughs, Wellcome & Co. One prize winner is a resident of New York now and others are scattered about the United Kingdom. A perusal of the list of the association's past officers shows that the members have always known who was fitted for the post of president, for all of these gentlemen who are now living occupy posts of more or less distinction, the attainment of which has proven their capabilities to have been of exceptional value in some direction. Only a few are now engaged in retail trade, and this fact seems an indication that a man who is a competent pharmacist and a good business man can often find a better market for his talents in another branch of his business. The portraits here given are those of the latest past presidents, but Era readers will perhaps remember the portraits of Dr. Attfield, Mr. Joseph Ince, Professor Greenish, Mr. Hills, Mr. Martindale and Mr. Tyrer, which have appeared in the Era columns, all of whom are patrons of the association.

The association met for many years in a room in Great Russell street, but have been obliged to remove recently owing to building operations requiring the old premises, but the new premises are in the immediate neighborhood, and the move will make no difference in the work of the association.

The proceedings of the association are published annually, and form an interesting volume and are records of the good work that has been published, but the members only can bear testimony to the social benefits which they receive and the many friends which they find amongst their fellow members.

REVISION OF THE U. S. PHARMACOPŒIA.

Report of the Committee to the Officers and Members of the Illinois Pharmaceutical Association.

We do not approve of the suggestion of the introduction of Doses in the Pharmacopœia.

We recommend dropping from the official list all liquors and wines known as beverages and the official preparations of which they are component parts. Should, however, it be necessary to retain any of these, then alcohol or acetic acid be used.

We recommend the reduction to one-half of the quantity of the drug for all fluid extracts, excepting buchu, cotton root, ergot, frangula, ipecac, licorice, rhubarb, sarsaparilla, sarsaparilla compound, senega, senna, taraxacum, uva ursi, valerian and wild cherry.

Crude carbolic acid obtainable in the market does not come up to the requirements of the Pharmacopœia. Shall the standard be changed to that of the market?

Lard, in the summer months, and in warm climates, there should be an addition of stearic acid to raise the melting point.

Lard, benzoinated. Dissolve the benzoin in purified wood alcohol, add to this solution castor oil, drive off the spirit by aid of heat, and employ the oily solution of benzoin for benzoinating the lard.

Chlorine water. Alternate official process with that of potassium chlorate and hydrochloric acid.

Medicated waters to be made with hot water and essential oils.

Cerate. Use benzoinated lard in the process.

Collodion. Use acetone as solvent for gun cotton instead of ether and alcohol.

Solution of ammonium acetate. Reinstate the alternate process of 1880.

Solution of magnesium citrate. Add potassium bicarbonate when solution is dispensed.

Replace extract of jalap by resin of jalap in formula for compound cathartic pills.

Ointment. Use benzoinated lard in formula for simple ointment.

Ointment of tar. Replace the present formula by that of 1880, using suet instead of wax.

Ointment of sulphur. Follow directions for zinc ointment, "sifting into the melted lard."

Benzin. Requirements of the Pharmacopœia are not met in market.

Use benzin in the processes instead of ether, in deodorized opium, deodorized tincture of opium, extract of opium (to retain pulverulent condition), to remove the fatty oils from ergot, colchicum seed, nux vomica and strophanthus seed prior to making the official liquid preparations.

Introduce granulated opium of a definite morphine strength for use in making the official liquid preparations of opium.

Introduce glucose syrup. Use it in place of glycerin in fluid extracts, in mixtures of rhubarb and soda, and for mucilage of acacia in brown mixture.

In the formula for mucilage of acacia replace half of the water with lime water.

Introduce purified methyl, or wood, alcohol and replace with this spirit the grain, or ethyl, alcohol in the processes for resins of jalap, podophyllum, and scammony, in all solid extracts, spirits myrcia (bay rum), tinctures of arnica, benzoin, benzoin compound, calendula, iodine, pyrethrum, and quillaja, and in the liniments of ammonia, soap, soft soap, and mustard compound.

Add to the formula for syrup of ferrous iodide about 10 per cent. of pure anhydrous grape sugar.

Introduce syrups of coffee, stillingia compound, trifolium compound, yerba santa, and white pine compound.

Introduce solution of ferric phosphate 50 per cent., tincture citrochloride of iron, elixirs of ammonia valerianate, cinchona, cinchona with iron, pepsin, and potassium bromide.

Introduce berberis aquifolium and saw palmetto with fluid preparations and fluid preparation of zea.

Introduce bismuth salicylate, bismuth subgallate, cinchonidia salicylate, quinine salicylate, talcum and zinc sulphocarbolate.

We approve of the introduction in the Pharmacopœia of articles having a definite composition that are patented or trade-marked, under a proper scientific name, the trade name as the synonymn. We would recommend for recognition the following:

Antipyrine, aristol, ichthyol, iodol, papain, or papoid, phenacetin, saccharin, and sulfonal.

Drop from list of preparations tincture of musk; if thought advisable, reduce the strength of musk to 2 per cent., and direct the use of lime water for water.

ALBERT E. EBERT,
GEO. E. CASE,
M. B. TRAVIS.

PHARMACY.

ALCARNOSE.—A new nutritive preparation.

HAEMOTROPIN.—A stable, pleasant fluid preparation of hæmoglobin.

KRYOFIN.—A condensations product of phenetidin and methyl-glycolic acid.

OSSIN.—A dark-brown, bitter fluid, which is intended to be used in treatment of diabetes.

COLLAFORM.—A formaldehyde gelatine in powder form, to be used as a wound antiseptic.

PARA-CHLORO-PHENOL PASTE.—An ointment prepared from equal parts of vaseline, lanolin, starch and para-chloro-phenol. Used in lupus.

SANAL.—An ointment consisting of litharge, red bolus, calamine, balsam of Peru, yellow wax and petrolatum, which is used in treating open sores, etc.

HUMINAL.—A liquid alkaline extract prepared from a ferruginous turf, and which is to be added to the bath used in treating rheumatism, gout, female diseases, etc.

SANOFORM (Di-iodo-salicylic-methyl-ester)—A white, inodorous, non-toxic substitute for iodoform. It is used either as a dusting powder or in the form of an ointment.

BAVAROL.—A clear red-brown oleaginous fluid of aromatic tarry-like odor, and sweet, burning taste. Proposed as a disinfectant in 1 to 5 per cent. aqueous solution.

CEMENT FOR CELLULOID.—To cement celluloid to wood or metal a solution consisting of 2 p. of shellac, 3 p. of spirits of camphor, and 4 p. of strong alcohol may be used.

A SENSITIVE TEST FOR TANNIN.—A solution containing 1 gm. of sodium wolframate and 2 gm. of sodium acetate in each 10 cc. This gives with tannin in acid or alkaline solution an insoluble yellow precipitate.

FLORIDA WATER.—Ol. bergamottæ. 150; ol. limonis. 90; ol. aurant. cort., 60; ol. lavandulæ, 105; ol. caryophyll. 15; ol. cinnamon., 15; ol. aurant. flor., 15; alcohol, 18,000; aq. destill., 4,500.—Pharm. Zeitg. Pharm. Jour.

MONSONIA TINCTURE.—A tincture prepared from the entire plant of the Monsonia ovata or burkei (Geraniaceæ), which in doses of from 8 to 15 gm. relieves acute dysentery in two to three days and chronic in eight to ten days.

BRONZE VARNISH.—In a mixture of equal parts of spirit of mastic, tincture of benzoin and tincture of myrrh 10 per cent. (wt.) of Canada balsam is dissolved, then this is mixed by trituration with 25 per cent. of dark copper and light aluminium bronze.

POLISH FOR FURNITURE, FLOORS, ETC.—A French patented preparation for polishing furniture, floors, linoleum, marble, etc., consists of 100 liters of benzine, 15 kilos of yellow wax, 1 liter of alcohol, ½ kilo of aqua ammonia, and ½ kilo of oil of lavender.

PYRIDIN GUAIACOLATE.—A new remedy for phthisis, obtained by the action of piperidin on guaiacol. It forms prismatic needles, melting at 79.8° C., soluble to the extent of 3.5 per cent. in water, decomposed by acids or alkalies. In the duodenum this compound is split up into its components, pyridin and guaiacol. The dose varies from 0.3 to 2 gm. three times daily.

OSSINOEL.—A new lubricant, which, according to Landrin (Ch. Zt.), consists of a mixture of vegetable oils with herring oil containing from 0.326 to 0.42 per cent. of fatty acid. At 15° C. a solid neutral fat separates; this difficulty can be overcome by the addition of petroleum.

TITROLES.—In Germany, the familiar combinations of malt extracts with various oils have been introduced as novelties and re-named "Titroles" and have been patented in Germany under that name (Pharm. Jour.) Castor and cod liver oil titroles are stated to be extremely efficacious preparations.

OSSALIN.—An ointment vehicle which consists of fresh bone mark of the ox, capable of taking up 200 per cent. of water, and is readily absorbed by the skin. It has a grayish color, and very faint tallow-like odor.

Sodium ossalinate is recommended in place of cod liver oil.

VITELLIN CREME.—Bernegan recommends yolk of egg "which remains from the manufacture of albumin paper, and is therefore to be had cheaply," for nutritious therapeutic and cosmetic preparations. Equal parts of yolk of egg, benzoated olive oil and alapurin perfumed make a very good cosmetic preparation, vitellin creme.

PHENAMINE AND TRIPHENAMINE.—Phenamine is the title given by Limlhorst to phenocoll. Triphenamine, according to Langkopf, is a mixture of phenocoll pur., 2.6; phenocoll salicylate, 1.0; and phenocoll acetate, 0.4 (Zeit. d. allg. oest. Apoth. Ver., Pharm. Jour.)

EUNATROL.—Under this name Messrs. Zimmer & Co. have placed a very pure sodium oleate upon the market. It forms a fine white powder without any unpleasant rancid taste. Eunatrol is recommended as an unexcelled effectual cholagogue in doses of 1 gm. twice daily, best administered in pill form.

STEARATES OF THE ALKALOIDS.—Zanardi has prepared stearates of morphine, atropine, and cocaine. Morphine stearate, $C_{17}H_{19}NO_3C_{17}H_{25}COOH$, is prepared by adding morphine to a solution of stearic acid in alcohol. Pearly scales are formed, melting at 85°. Atropine stearate melts at 120°, and cocaine stearate at 90°. These salts are soluble in almond oil and form a useful method of administering the drug. (Br. & Col. Dr.)

DISTRIBUTION OF ARSENIC IN THE ORGANISM.—Experiments were made upon a guinea pig to determine in what parts of the organism arsenic collects. It was found as follows: In the stomach, 49 per cent.; in the liver and spleen, 26 per cent.; in the intestines, 7 per cent.; in the heart and lungs, 8 per cent., while the remaining 10 per cent. could not be found; this was probably distributed in the blood and cellular tissue or was excreted in the urine or fæces.

SAPONIN EMULSIONS.—Sehazki (Moniteur Phar.) recommends the following:

1. Castor oil 30 gm., saponin 0.15 gm., water 150 gm.
2. Cod liver oil 100 gm., saponin 0.2 gm., water 100 gm., oil of peppermint 2 drops.
3. Balsam copaiba 5 gm., saponin 0.12 gm., water 95 gm.
4. Creosote 1.25 gm., oil of bitter almond 10 gm. (free from HCN), saponin 0.06 gm., water 100 gm.
5. Iodoform 2 gm., oil of bitter almond 8 gm., saponin 0.15 gm.; water 100 gm.
6. Chloroform 0.5 gm., oil of bitter almond 15 gm., saponin 0.12 gm., water 100 gm.
7. Camphor 0.8 gm., oil of bitter almond 15 gm., saponin 0.12 gm., water 100 gm.

It is presumed that the HCN free oil of bitter almond is employed.

ICHTHALBIN (Ichthyol-albumin).—A tasteless and inodorous preparation of ichthyol, which, like tannalbin, is a combination with albumin. Ichthalbin forms a very fine grayish-brown powder, which contains about 40 per cent. of ichthyol-sulfonic acid. When taken internally it passes through the stomach unchanged into the duodenum, where it gives up free ichthyol. Unlike the latter, no nausea is noticeable, and the unpleasant eructations are reduced to a minimum in this new combination. Dose, 1 to 2 gm. daily.

PARALDEHYDE, A REAGENT FOR IODINE COMPOUNDS.—To the solution which is to be tested for the presence of iodine, some starch paste is added, followed by a few drops of paraldehyde, without shaking; according to the percentage of iodine present, the line of contact of the two fluids is stained red to blue. Or the fluid to be examined is shaken with a few drops of paraldehyde, followed by either starch paste or carbon disulphide. The presence of one part of iodine in 500,000 to 1,000,000, can be detected by this test.

INODOROUS OIL OF TURPENTINE.—Szigethy (Drug. Ztg.) recommends shaking the oil with a 10 per cent. solution of sodium carbonate (calculated as anhydrous) in order to combine the acid and resinous impurities, then it is washed several times with distilled water, finally distilling the product under reduced pressure of 12 m.m., in a current of steam and carbonic acid gas. The distilled oil should be allowed to remain in the atmosphere of carbonic anhydride until entirely cold. The author claims that the odor of turpentine oil is entirely due to the oxidizing action of the atmosphere.

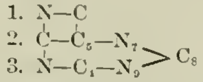
EUCHININ.—The ethyl carbonic ester of quinine possessing the formula $CO > {OC_2H_5 \atop OC_{20}H_{23}N_2O}$. It forms white silky needles, melting at 95° C., difficultly soluble in water, readily in alcohol, ether and chloroform. It is basic and forms crystalline salts with acids; its solution in diluted sulphuric or nitric acid fluoresces blue like quinine. The base euchinin is almost tasteless, but when kept upon the tongue for a long time a faint bitterness is perceptible; when a green in wine or chocolate this is entirely avoided. Long continued administration of large doses of 1 to 2 gm. per day showed no disturbances whatever.

BACTERIA IN INK.—Dr. Marpmann, of Leipzig, has recently published the results of the microscopical examination of sixty-seven samples of ink used in schools. Most of them were gall inks, and contained saprophytes, bacteria and micrococci. Nigrosin ink, taken from a freshly opened bottle, was found to contain both saprophytes and bacteria. Red and blue inks also yielded numerous bacteria. In two instances Dr. Marpmann succeeded in cultivating from nigrosin ink a bacillus which proved fatal to mice within four days. The presence of these pathogenic organisms in ink accounts for the nasty sores which sometimes result from the scratch of a pen.

ANÆSTHESIA STATISTICS.—According to statistics given at the annual congress of surgeons in Berlin (April, 1897,) during the previous two years (1895-1897), 58,769 cases were reported in which anæsthetics were employed. In 27,400 cases chloroform was administered, with 29 fatal terminations; ether was given about 19,000 times, with only three deaths reported. Chloroform-ether mixture was employed 4,900 times, and brom-ethyl 1,500 times; with these no deaths were reported. Since 1891, 327,599 cases of anæsthesia have been reported, with 134 deaths, a proportion of 1 to 2,445. With pental the proportion of deaths was 1 in 230, with chloroform 1 in 2,039, ether 1 in 5,090, ethyl bromide 1 in 5,228, and chloroform-ether mixture 1 in 7,594.

THE INFLAMMABILITY OF BARIUM PEROXIDE.—Some time ago a fire broke out on board a ship containing, among other cargo, several barrels of barium peroxide. The matter having been referred to Dr. Dupré, he regarded the barium peroxide with suspicion, because of his experience with sodium peroxide, upon which he gave a paper last year. On experimenting with the peroxide he found no difficulty in igniting it, when the powder is rubbed with some force between two pieces of wood. This was well illustrated by sprinkling some of the peroxide on a flat piece of wood, and rubbing quickly with a smooth rounded piece of wood, shaped like a pestle. The powder at once took fire. The moral drawn was that henceforth barium peroxide must be classed as dangerous, and instead of being exported in oaken casks, only iron drums should be used.—(Br. and Col. Dr.)

CONSTITUTION OF CAFFEINE, XANTHINE AND RELATED BASES.—According to his latest investigations, Emil Fischer claims that all compounds of the xanthine and hypoxanthine series as well as those of uric acid are derivatives of a hydrogenized compound $C_5N_4H_4$ of the neucleus



$$\begin{array}{ll} 1. & N-C \\ 2. & C-C_5-N_7 \\ 3. & N-C_4-N_9 \end{array} > C_8$$

which he names "Purin."

If hydrogen is replaced by the hydroxyl group, then products of the xanthin and uric acid type result; the technical titles being expressed by the number of oxygen atoms entering into the nucleus purin, thus hypoxanthin is called oxy-purin, uric acid, trioxypurin, etc. If these products are methylated, the entering group being attached to a nitrogen, the title would be tetra-methyl-trioxy-purin instead of tetra-methyl-uric acid (old style). Caffeine is 1, 3, 7 tri-methyl—2,6, di-oxy-purin. Guanin is 2, amino—6, oxy-purin. Adonin is 6, amino purin. The chief result of Fischer's investigations shows that uric acid, xanthin, hypo-xanthin and adonin are closely related derivatives of the same nucleus, which offers new and interesting data for the physiologist.

THEIR STAMPS WERE ADS.—When, in 1862, it became necessary for the United States to adopt measures by which a portion of the revenue necessary to vigorously prosecute the war against the Confederate States could be raised, Congress decreed that a tax, to be paid by the means of revenue stamps, be levied on an extended list of articles. The stamps assessing the tax on these commodities were to be of the regulation "proprietary" issue or of a private, distinctive issue, as explained by the provisions of the revenue bill, as follows: "Provided, nevertheless, That any (manufacturer) proprietor or (manufacturers) proprietors of proprietary articles shall have the privilege of furnishing, without expense to the United States, in suitable form, to be approved by the Commissioner of Internal Revenue, his or their own dies or designs for stamps to be used thereon, to be retained in the possession of the Commissioner of Internal Revenue for his or their special use, which shall not be duplicated by any other person."

Here was an opportunity for a bit of advertising which the enterprising patent medicine man could not overlook. Immediately private dies were brought into requisition and the medicine, perfumery, etc., manufacturer paid the tribute on his wares by a stamp which was an advertisement of his business. Among the firms that had private stamps were: J. C. Ayer & Co., Joseph Burnett & Co., Centaur Co., Perry Davis & Son, Hostetter & Smith, Johnson, Holloway & Co., Merchant's Gargling Oil Co., Seabury & Johnson, A. Vogeler & Co., and others.

The Commissioner of Internal Revenue was the court who passed upon the fitness of the designs submitted, and he allowed the manufacturers considerable latitude. Some of the stamps are of odd size and novel design and a few are of grotesque appearance. The trade-mark of the issuing firm is common as the central design of many of the stamps, while as many more bear the likeness of the proprietor of the firm. The denomination and "U. S. Internal Revenue" were on each stamp.

It was ordered that the stamps be placed on packages or bottles in such a way as to insure mutilation of the stamps when the articles were opened. For instance, one of Ayer's stamps was of the stellated design and fitted over the cork of the bottle.

These stamps proved to be better ads than were ever dreamed of by their projectors. Even to-day, over thirty years after the issue of the stamps, they are standing ads, even though the proprietary tax has long since been repealed, for philatelists gather these stamps and place them in albums. They are listed in stamp catalogues, and dealers sell these revenues at prices ranging from one cent to fifty dollars each.—Adv'g World.

AN EXCITING EXPERIENCE.—A bull in a china shop cuts no figure beside a weasel in a drug store, if we may believe the graphic story which comes from a North Dakota town. It is this:

"The other day a man brought a weasel into the drug store to apply on prescription. They took the weasel and the man took the prescription. What the medicine did to the man is not known, but what the weasel did to the drug store is pretty thoroughly understood. The weasel is a slender agile insect, about six inches long, of an India rubber disposition. It turns round corners and pushes into places that an elephant would not think of going. This weasel, after it became the property of the drug store, was put in a cage to get gamey, and after it had gamed up for a day or two was set at liberty in the store. The weasel's steady trade is killing mice and other fowl and it was set loose that evening to work for its board. It was just at closing-up time that the weasel went on duty, and it hasn't been back to its cage since, but it has been back of almost everything else, and the next morning the drug store was an unswept wreck. Two dogs sleep in this store at night; they had always been very temperate in their sleep and had never been known to get up in the night and bark into the telephone or tip over the safe for exercise; but when they saw this slim weasel, by the sad light of the coal stove, slide along the floor they went after it like noise out of a small boy with a hammered thumb. The dogs made a mistake for the first few hours in thinking they could catch it without killing it first; then they undertook to kill it by overturning everything movable in the store, but the weasel wasn't caught in the squeeze; everything in the holiday department that had been stored under the counters was scattered around the floor. When the weasel went back of a row of bottles the dogs tried to do the same and the bottles helped to chase the weasel. The store presented a picture of despair when it was opened next morning. It was a case of misplaced weasel.

A LETTER.—The following letter from a patient was received by a Texas physician a few days since, and it explains itself:

"Dear Dock:—I forgot to tell you when I was there I have been. wind broken for about two weeks. wright in the pit of my stomache has dropped down and wont hold and do no digestion the wind works up on me all through my shoulders and system and dont work down and give me something to work it down and keep it at its proper place and when I eat everything just drops down in the pit of my stomache like I havnt any top bowels. Please send me something to stop that gas and wind from working backward and forward and gives me nervous spells and gives me a pregnit feeling of the womb. Please send me something to stop it."—Texas Med. News.

Here's A Druggist for You.

Bonfort's Wine and Spirit Circular prints this story of the ignorance of a druggist and the cupidity and unscrupulousness of a drug jobber:

"A young man recently starting into the drug business in an Indiana city sent an inquiry to a wholesaler as to what constituted a first-class whisky stock for an up-to-date drug store, and received the following list: Fire copper Bourbons—Tea Kettle, Richwood, Melwood, Meadow Brook, and Elk Run; sour mash Bourbons—McBrayer, Hermitage, Belle of Anderson, Atherton, Carter, Beechwood, Hume, McKenna, O. F. C. Taylor, Old Taylor, Seal of Kentucky, McEwen, Elk Run, R. B. Hayden and Fountaindale; ryes—Susquehanna, Rosebud, Shandon Bells, Normandy, Clark's, McCormick and Sherwood; bottles whiskies—Canadian Club, Clifton, Belle of Bourbon, Old Crow, Meredith's, Bell of Anderson, Beechwood, Clark's, Elk Horn, O. F. C., Old Hermitage and Old Rockdale. The adolescent druggist bought a small quantity of all the brands submitted, and now prides himself with having the best-assorted stock of whiskies in town. The young man probably never learned that there are others. But, where ignorance is bliss it is folly to be wise, especially while the fellows who have something just as good to sell are hunting for him. The wholesaler who supplied this druggist says this is the only instance within his wide scope of experience where a man bought everything he was recommended to buy and every brand of whisky he carried in stock. He thinks the case is a unicum, but further deponent sayeth not."

QUICK RESULTS.—Pill Manufacturer—You say that every man in your Congressional district reads at least two copies of your paper, but does that imply that it is necessarily a good advertising medium?

Editor Morning Crow—Good advertising medium? Well, I should smile! Why, look here: Last March a new doctor came here and inserted a two-line ad. Just three days after that a man broke his leg, and before the end of the week half the town had the measles so bad you could fairly hear them break out.—Puck.

"A CHICAGO CHANSONETTE" is the euphonious title of a poetical effusion suggested to the Daily News of that city by the numerous hold-ups of druggists by robbers some weeks ago. It reads thus:

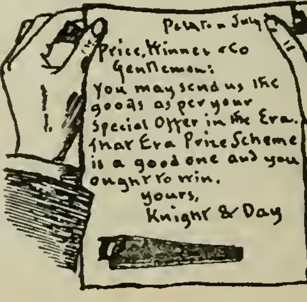
"If there's anything easy"—the highwayman said,
As he shouldered the bundle of "swag,"
And presented his victim with friendly advice
To be sure and not swallow the gag—

"If there's anything soft in the 'stick-up' perfesh
It is found in the druggist's domain."
Then he noticed the victim look out of one eye
And went over and kicked him again.

Then he fell on a clerk he had quite overlooked,
And a porter but poorly concealed;
Then a couple of cronies who sat in the rear
And were really quite anxious to yield.

Then down in the basement he cheerfully dived
And unearthed a few helpers at work,
And they, too, mechanically threw up their hands
With a sort of well-disciplined jerk.

Then the highwayman rung up a telephone call
To the druggist he next had in mind,
And suggested that he should prepare for a call
With his hands tied securely behind!



Peru — July
Price, Kinner & Co
Gentlemen:
You may send us the
goods as per your
Special Offer in the Era.
That Era Prize Scheme
is a good one and you
ought to win.
Yours,
Knight & Day

QUESTION BOX

The object of this department is to furnish our subscribers with reliable and tried formulas and to discuss questions relating to practical pharmacy, prescription work, dispensing difficulties, etc. Requests for information are not acknowledged by mail and ANONYMOUS COMMUNICATIONS RECEIVE NO ATTENTION.

Shampoo Paste.

(T. M.) See this journal, May 6, 1897, page 544.

Ink Erasive.

(F. M.) See page 571, May 13, 1897, issue of this journal.

Cement for Pottery.

(C. L. R.) See "cement for china ware," last issue, page 15.

To Drive Away Mosquitoes.

(O. O. S.) See under caption "To Drive Away Flies," this journal, May 27, 1897, page 633.

Manufacturer of Kola Seltzer.

(F. H. H.) Kola Seltzer is manufactured in Philadelphia. Address Kola Seltzer Co., 1200 Race street, that city.

Polytechnic School in Hoboken, N. J.

(Pavalolo.) The Stevens Institute of Technology is located at Hoboken, N. J. Address Prof. Henry Morton, Ph. D., for information concerning courses of instruction.

Resinol.

(R. F.) Resinol is a proprietary preparation in ointment form, and recommended by the manufacturers as a "harmless antiseptic and true skin anæsthetic." We cannot give the formula.

Antitoxine.

(H. N. P.) We cannot give you the formula for the proprietary preparation Antitoxin, manufactured by the British Antitoxine Manufacturing Company, London, England. It is said to be a compound coal tar product, an antipyretic and antineuralgic, and in no way connected with the diphtheria antitoxic serum.

Compound Elixir of Calisaya with Chlorides.

(L. P. K.) Try the following:

Solution protochloride of iron, N. F.	48 minims
Mercuric chloride	1 grain
Solution arsenic chloride	50 minims
Compound elixir quinine, N. F., enough to make	16 ounces

Mix, dissolve and filter.

Syrup Sarsaparilla with Iron.

(H. M. H.) Try the following:

Potassium iodide	256 grains
Citrate of iron and ammonium	256 grains
Fluid extract senna	2 ounces
Fluid extract licorice	2 ounces
Water	1 ounce
Compound syrup of sarsaparilla, enough to make	16 ounces

Essence of Cherry.

(L. J. S.) Cherry juice is generally used when cherry flavoring is wanted. The flavor may be improved by the addition of a small quantity of spirit of almond. Another formula is this one: Distil 5½ pounds of crushed cherry stones with 7¾ gallons of water, add 4½ to 5 gallons of cherries, and distil off 3 to 4½ gallons of essence. Dussauce gives the following for an "artificial extract":

Ethyl acetate	5 parts
Ethyl benzoate	5 parts
Ethyl œnanthylate	1 part
Alcohol saturated with benzoic acid	1 part
Glycerin	3 parts
Alcohol, enough to make	100 parts

Terra Alba: Talc.

(J. W.) Terra alba is a synonym for bolus alba of the German Pharmacopœia. It is also known as argilla, an aluminum silicate which contains small quantities of magnesia and traces of iron.

Talc is a silicate of magnesium, having the general formula 4 Mg. SiO_3 4 H_2O. It is also called "steatite." Information concerning both of these earths may be found in the dispensatories.

Ointment of Maganese Dioxide.

(J. S. P.) Griffith "Universal Formulary," (1874), is authority for these:

(1) Manganese dioxide	1 part
Lard	2 parts
Mix thoroughly.	
(2) Manganese dioxide, Sulphur, Soap, of each	1 ounce
Lard	3 drams

Both of these ointments have been recommended in porrigo and other skin diseases.

Apothecaries in the Navy.

(W. F. S.) The apothecaries in the Navy are required to be enlisted men who are graduates in pharmacy and have passed an examination before a board composed of three medical officers of the navy. The scope of this examination is shown in Naval Regulations Circular No. 2, dated March 13, 1893, which may be obtained by addressing the Chief of the Bureau of Navigation, Navy Department, Washington, D. C. The pay is $60 per month. See also articles on this subject in previous volumes of the Era. Consult the indexes.

Moulding Wax.

(C. L. R.) See formulas under "Dental Modeling Wax," this journal, March 4, 1897, page 272. Here is another one: Mix 200 parts of soapstone powder and 100 parts of best wheat flour, and stir the mixture carefully into 300 parts of melted white wax, not too hot. The homogeneous mass may be colored at pleasure. Or, melt carefully over a moderate coal fire 100 parts of yellow wax, and then add 13 parts Venetian turpentine, 6½ parts of lard, and 72½ parts of elutriated bole. Mix thoroughly, pour the mixture gradually into a vessel containing water, and knead it several times with the hands. The wax must be melted at so low a temperature as not to create bubbles.

Pepsin in Powders.

(A. E. G.) submits the following prescription:

Bismuth subnitrate	10 grains
Pepsin	20 grains
Salol	5 grains

Mix and divide into ten powders.

On account of the hygroscopic character of pepsin it is not perfectly adapted for dispensing in ordinary powder papers, and this is where our correspondent experienced his difficulty. This absorption of moisture may be somewhat overcome by the addition of a suitable quantity of powdered sugar of milk (20 or 30 grains). The powders should also be wrapped in paraffin paper. To dipense, triturate the pepsin with the powdered sugar of milk, add the bismuth subnitrate and lastly the salol.

White Metal Letter Signs.

(J. E. W.) A white mixture for enameling metal letters for signs, is this one:

Cullet	11 pounds
Boric acid	7 pounds
Sodium bicarbonate	¼ pound
Calcium phosphide	3½ pounds
Antimony oxide	⅛ pound

The mixture is fused on the metal letters by the blow pipe or by heat of a furnace. Various other enamels are used in which glass, metallic oxides, etc., are employed, the resulting compound being united to the iron by fusion. Unless you have suitable facilities for manufacturing these enamels and afterwards applying them you had better purchase your signs ready made. They will be cheaper and very likely more satisfactory.

Corn Salve.

(H. N. P.)

(1)	Salicylic acid	1 dram
	Resin ointment	7 drams

Melt the ointment and stir in the acid.

(2)	Salicylic acid	10 parts
	Balsam fir	5 parts
	Resin	6 parts

Melt the resin, add the balsam of fir and stir in the salicylic acid as it cools. This preparation can be spread on any suitable medium for a plaster.

(3)	Salicylic acid	10 parts
	Lactic acid	10 parts
	Simple cerate	80 parts
(4)	Yellow wax	6 ounces
	Venice turpentine	¾ ounce
	Pure resin	½ ounce
	Salicylic acid	½ ounce
	Balsam Peru	½ ounce
	Vaseline	1 ounce

Melt over slow fire, or the best way is melt on a water bath. Stir until cool.

Compound Elixir of Iodides.

(H. M. H.) We cannot give the formula for the proprietary article. An elixir containing the iodides of arsenic, mercury, manganese, sodium, potassium and iron may be prepared by the following formula:

Arsenic iodide	1 grain
Mercuric iodide	1 grain
Manganese iodide	13 grains
Sodium iodide	128 grains
Potassium iodide	128 grains
Solution iron iodide, N. F.	15 minims
Sodium hypophosphite, enough.	
Aromatic elixir, enough to make	16 fl. ounces

Dissolve the iodides in the elixir by agitation, add a few grains of sodium hypophosphite, or sufficient to decolorize the elixir, and filter. Each fluid dram contains $^{1}/_{128}$ grain each of iodides of mercury and arsenic, $^{1}/_{12}$ grain of ferrous iodide, $^{1}/_{10}$ grain of manganese iodide, and 1 grain each of iodides of sodium and potassium.

Woman's Relief.

(L. J. S.) We cannot give the formula for the preparation you name. Under the above title you may safely dispense compound elixir viburnum opulus of the National Formulary. Here are two other formulas for similar preparations:

(1)	Fluid extract squaw vine	4 ounces
	Fluid extract cramp bark	2 ounces
	Fluid extract blue cohosh	2 ounces
	Fluid extract damiana	2 ounces
	Fluid extract helonias	2 ounces
	Fluid extract cinchona	2 ounces
	Sherry wine	50 ounces
(2)	Fluid extract life root	1 ounce
	Fluid extract helonias	1 ounce
	Fluid extract black haw	1 ounce
	Fluid extract cascarilla	1 ounce
	Fluid extract cascara sagrada	2 drams
	Fluid extract Jamaica dogwood	6 drams
	Fluid extract rhubarb	4 drams
	Alcohol	12 ounces
	Simple syrup	10 ounces
	Simple elixir, enough to make	48 ounces

Violet Ammonia for Toilet Use.

(W. & I.) Most preparations of this character consist of either coarsely powdered ammonium carbonate, with or without the farther addition of ammonia water, or of a coarsely powdered mixture which slowly evolves the odor of ammonia, the whole being perfumed by the addition of volatile oil, pomade essences or handkerchief extracts. The following is a typical formula:

(1) Moisten coarsely powdered ammonium carbonate contained in a suitable bottle with the following mixture:

Concentrated tincture of orris root	2½ ounces
Aromatic spirits of ammonia	1 dram
Violet extract	3 drams

(2)	Oil of orris	5 drops
	Oil of lavender flowers	10 drops
	Violet extract	30 minims
	Stronger water of ammonia	2 fl. ounces

Fill suitable bottles with coarsely powdered ammonium carbonate, and add to the salt as much of the aromatic solution as it will absorb.

Hair Balsam.

(O. O. S.) We cannot give the formula for the proprietary article. The following are sometimes sold under the above title, and it may be that one of them will serve your purpose:

(1)	Alcohol	9 ounces
	Spirit of soap	3½ ounces
	Tincture cinchona	2 ounces
	Tincture cantharides	1 dram
	Balsam Peru	5 drams
	Oil bergamot	2 drams
	Oil orange	2 drams
	Oil rose geranium	1 dram
(2)	Castor oil	10 drams
	Balsam Peru	3 drams
	Jamaica rum	12½ ounces
	Distilled water	6 ounces
	Tincture cinchona	1½ ounces
	Cologne water	1½ ounces

French.

(3)	Oleo-balsamic mixture	4 fl. ounces
	Glycerin	5 fl. ounces
	Rose water	20 fl. ounces
	Tincture cantharides	½ fl. ounce
	Ammonium carbonate	1 ounce

Mix, shake thoroughly, let stand for one hour, and filter.

Pink Color for Show Globes.

(L. T.)

(1)	Cobalt oxide	1 gram
	Nitric acid	49 grams
	Water to make	1000 grams

Dissolve the cobalt oxide in the acid, then add the water.

(2)	Nitrate cobalt	100 to 270 grains
	Carbonate ammonium	5 drams
	Water	18 pints

Triturate the nitrate of cobalt in a mortar with the carbonate of ammonium, adding water enough until solution is effected, and the at first formed precipitate of cobalt carbonate is redissolved, then adding the remainder of the water. The smaller quantity of nitrate of cobalt will suffice where a large bulk of fluid is interposed between the light and the window. The greater when the reverse.

(3)	Sodium salicylate	16 grains
	Tincture of iron chloride,	
	Hydrochloric acid, of each sufficient,	
	Water	2 gallons

Dissolve the sodium salicylate in the water and add (cautiously) tincture of iron in single drops until the proper tint has been realized. Hydrochloric acid may be used carefully (in drops) to render the tint paler. Should too much acid have been added, restore the tint by the addition of ammonia.

Sheep Dip.

(F. M.) See this journal, Aug. 13, 1896, page 213. Here are some others:

(1)	Arsenous acid	12 ounces
	Dried sodium carbonate	12 ounces
	Sulphur	4 ounces

Mix and dissolve in a few gallons of boiling water, then add enough more water to make 30 gallons, to which if desired may be added a few pounds of soft soap. Sufficient for twenty-five or thirty sheep. Another and favorite form of arsenical dip is prepared by substituting yellow arsenious sulphide for arsenous acid in the above formula. A so-called "non-poisonous" dip is the following:

(2)	Manufactured tobacco	1 pound
	Potassium carbonate	1 pound
	Sulphur	1 pound
	Soft soap	1 pound

THE PHARMACEUTICAL ERA

[*WEEKLY.*]

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ERA COURSE IN PHARMACY.

Some preliminary announcements and instructions for pupils who intend to join the regular classes of the ERA COURSE IN PHARMACY will be found on page 69 of this issue.

All drug clerks and druggists who intend to matriculate for this Home Study Course in Pharmacy should see that their applications are filed as soon as possible, so as to receive all the preliminary instructions to be printed in our July and August issues. The regular lectures begin with the first issue in September.

THE COMPLETE PROSPECTUS is now ready and will be sent upon request.

Address, THE PHARMACEUTICAL ERA,
P. O. Box 1483, New York.

A Druggist on the Situation.

A successful, thoroughly practical druggist in a Western State expresses his views quite forcibly anent the past, present and future condition of pharmacy. "Radical changes have been brought about in the general character of the drug store and stock during the past twenty years, particularly in the laboratory and prescription departments. That erstwhile useful article, the pill tile, and likewise the plaster block will soon be on exhibition among the curios. Why? To make room for the 'elegantly finished, guaranteed to stand any climate' ready-made pills of a cohesion capable of withstanding the test of being driven with a hammer into a board. And for 'the only gold medal award at the Oshkosh fair' plasters, encased in highly colored and much printed wrappers, which give the delightful assurance that 'the reputation of our firm is a guarantee for the quality' of the goods, and investigation into the quality and quantity of lamp black in the belladonna plasters showing both to be fully up to expectations. We know the tendency to be in that same direction as regards everything in the store, and with tax free alcohol to the large consumer (which is not unlikely to occur) the boards of pharmacy may as well get in line and examine applicants in their proficiency in the art of conducting a soda fountain and wearing a pleasant smile. 'Skill' is being transferred, by degrees, from the legitimate field into the hands of pharmaceutical manufacturers. The latter are not to be blamed for the change; they invest their money and do a legitimate business. The responsibility must rest upon the shiftless and incompetent among the retail druggists. The shiftless, too lazy to keep up with the pace, and the incompetent oftentimes shrewd business men, but indifferent pharmacist, are compelled to purchase the ready-made articles to keep in touch with the ever increasing list of physicians who are too tired to do their own thinking, and who are willing that the patient should take his chances with the wonderful elixir of balloon juice recommended so highly by Prof. X. of the College of Timbuctoo, and of the composition of which they have not the slightest conception.

"Every pharmacist must make a battle ground of his own neighborhood, combat the ready-made cure-alls and what-nots as fiercely as you would the cutter, pay less attention to the sale of putty and gum, prove to every physician in your neighborhood that your own preparations are better than most and as good as the best. You can guarantee your own preparation to overcome the tired feeling and a cough will subside as quickly from a mixture prepared at your own premises as though made in Maine or Mexico. The pecuniary benefit derived from such a course is considerable, but the feeling of independence and self-reliance instilled into the young clerk and rising pharmacist is the hope of future pharmacy."

Rather breezy in style and diction, but the opinions and suggestions advanced demonstrate that the speaker has carefully observed and digested and concentrated his observations into a pretty accurate comprehension of the state of affairs in the world pharmaceutical. The pharmacist who wants to succeed professionally and in a business sense must be a close student of conditions and quick to adapt these rapidly changing conditions to his own business as they touch it more or less closely. The remarks quoted are worthy of attention as showing the attitude of a progressive retailer.

The Substituter and the Trade-Mark.

Now that the substitution strawpile is receiving its periodical threshing, it is refreshing to find one or two grains in the flailed chaff which may furnish a little nutriment. One manufacturer has volunteered the information to a contemporary in the advertising field that he loses nothing by substitution simply because his preparations have arbitrary names which are also trademarked. Herein seems a great advantage. The frown of the law is over the wily substituter. He may play havoc with Smith's Cough Cure by saying that Smythe's is "just as good," but he is balked when the resourceful and original Smith calls his preparation "Pertussine." There is no necessity for warning the public to take nothing else, for there is a weird fascination in coined names which engages the intellect and will of the buyer and deters the imitating tradesman. It is true the boy on his way to the drug store may stub his toe, disturb his memory and ask for "Fussine," but a few visitations of the wrath and reprobation of the newspaper press would make him look well to the manner of his future going.

The germ of advice contained in this incident will not bear fruit for those who have already established "sarsaparillas," "blood purifiers," "corn cures," etc., with no distinguishing mark but the possessive noun and the package. For them there will always be the distressing knowledge that there are others—and some of these have been sprinkled with the holy water of advertising while the rest have simply been prepared by the insignificant druggist who has nothing but a more or less profound knowledge of drugs to recommend him.

But for the future proprietary person and the unborn makers of panaceas, this idea of arbitrary name will be salvation.

The first lesson in the business will contain the injunction to first invent your name and then discover your great discovery. Indeed, this condition of affairs has already been anticipated. There is evidence in the Patent Office reports. Every week there is invented some new torture of our beloved alphabet which is duly trademarked to serve as the guardian angel of some new medicine.

The Worm of the "Tank."

The "Tank" drama was once so attractive in histrionic points that it secured for itself a warm place in the public heart. Its supposed decadence is, however, all a mistake. It has held the boards in Chicago for some time under the auspices of the W. C. T. U., and the always existing rivalry between this city and St. Louis has caused the latter to have a similar exhibition.

The "tank" in this instance is a popular term applied to the drinking fountains with penny-in-the-slot attachments provided or suggested by the W. C. T. U. for furnishing dry humanity with invigorating but non-intoxicating cherry phosphate. As there are always envious or bilious critics who find fault with things behind the footlights, so are there reactionaries with test tubes and reagents who profess to find danger—a shadow of the worm of the still—in this well-intentioned beverage. A St. Louis chemist is the chief offender. He made an analysis and brought to light some things and a conclusion as follows: "Syrup of wild cherry, orthophosphoric acid, magnesium phosphate, sodium phosphate, calcium phosphate, a very large proportion of syrup or molasses and yeast. In its present condition it contains no alcohol but when it gets into the stomach its character undergoes an alarming change—the sugar and yeast ferment—the starch of the sugar in combination with other substances is converted into pure alcohol. Lactic, carbonic and butyric acids, all corrosives, are also formed and these have a tendency to arrest digestion."

Chicago is of the opinion that St. Louis is using a cheap phosphate and gravely suggests that this cheap article may eat the linings out of the St. Louis tanks—a friendly warning which should not be disregarded even if coming from a rival. Besides, the suggestion is based upon experience. Last year Chicago analyzed her phosphate and found nitro-benzole, sugar, phosphoric acid coloring matter and some other things and also found that the composition did not attack the zinc lining of the tanks.

The situation is obviously an unfortunate one for tanks and, incidentally, stomachs, and in the refinement of captiousness there might be a question of morals. There are no reflections upon the good intentions of the original promoters of this scheme, but there is evident lack of wisdom in making things too cheap. The penny drink may pay for itself, but there is always a temptation to make it pay just a little more. The ocular weakness which is popularly supposed to cause "winking" at the soda fountain, cannot be cured by an automatic un-winkable apparatus which turns the innocent stomach into a distillery.

Poison Eaters of Long Ago.

Almost half a century ago, when a trial for murder in Austria brought up the question whether the dead man had been a poison-eater, a writer in one of the leading magazines of the time discussed the whole subject of this habit in a most interesting fashion, and his article is as readable to-day as it was then, because of the fact that the passion for consuming arsenic is as strong as ever—for which reason it may not be amiss to give anew some of the curious information collected at that time.

It appears that the peasants of Lower Austria were especially addicted to the strange habit of eating arsenic. They obtained it largely from hucksters, who, in turn, got it from glass blowers or quack doctors. It was learned that the persons who had formed the habit had been led into it for at least two reasons. One was a desire to acquire a fresh, healthy, plump appearance, concerning which a physician of the time said: "It is really astonishing with what favorable results their endeavors are attended, for it is just the youthful poison-eaters that are, generally speaking, distinguished by a blooming complexion and an appearance of exuberant health." But he went on to tell about one lassie who, not content with achieving that end, indulged in the poison to such an extent that sudden death followed.

The second object of the poison eaters, according to their own statements, was to become "better winded"; that is to say, to be able to climb hills more easily. Whenever they were obliged to go far or to mount to a considerable height, it was their custom to take a minute morsel of the arsenic and allow it to dissolve slowly in the mouth. They declared that the effect was remarkable; they could with ease climb mountains which under other conditions would have seemed extremely difficult to ascend. They said that they began the habit of poison-eating with great caution; but there was one hearty looking man of sixty who admitted that he took at every dose about four grains. He had been taking poison for the greater part of his life, having inherited the habit from his father.

The investigator learned that it was a common practice in Vienna to shake pulverized arsenic over horses' corn in order to give the animals a sleek and shining appearance, and even to put small quantities in the mouths of the animals for the purpose of making them foam and appear spirited. Farm servants said that they frequently strewed a pinch of it over the last feed of hay before going up a steep road, keeping up this practice for many years without discovering any injurious effect at all upon the horses. It was, however, conclusively shown that such animals suffered if there were any failure to give them the poison at intervals after they had been having it for some time.

Illegitimate Mail Matter.

Two well known and reputable druggists in Cincinnati have been arrested by United States authorities, charged with using the mails to advertise medicines to be used for alleged improper purposes, and it is stated that other arrests are to follow. We hope these druggists will be able to prove themselves not guilty, for the offense charged is a most disreputable one, and should not lie at the door of any pharmacist. The druggist has often been charged with keeping for sale certain unmentionable appliances and medicines, and some do keep them, and this is bad enough, but to advertise them in an attempt to build up a trade is going much too far. Possibly they must be kept in stock for entirely legitimate purposes, but they should be dispensed with much circumspection and not exploited publicly. There is a phase of this evil which should be condemned by every respectable and self-respecting pharmacist individually and formally by every association of pharmacists. This is the practice of the manufacturers of disreputable preparations of publishing in their advertisements "For sale by all druggists," "On sale at ——'s drug store," etc.

We have but recently spoken very freely concerning the indecent and immoral medicines advertised brazenly in the newspapers and urged that the authorities get after the law-breakers. It is therefore encouraging to note this activity in the matter of breaking up one feature of the abuse.

The State of Iowa vs. Spaulding.

Suel J. Spaulding, ex-secretary and treasurer of the Iowa State Board of Pharmacy, and his bondsmen, have been made defendants in a suit brought to recover $5,000 in consequence of a defalcation by Spaulding in 1895. This action has been anticipated for some time and has been previously referred to in the Era. A criminal suit was instituted against Spaulding over a year ago, the indictment charging him with embezzling $13,000 while acting as "secretary and treasurer" of the board, but this was dismissed upon the ground that no such office was authorized by the State laws.

The bondsmen are officers of the Iowa National Bank, Des Moines, and their defense will be that they did not go on Spaulding's bond as "secretary and treasurer," but simply as secretary, and claim to be in a position to prove that the words "and treasurer" were inserted after the bond was executed. They will also set up the claim that the offices of secretary and treasurer are not legally constituted but are creations of the pharmacy board, and that the latter should be held responsible for the shortage. The State Attorney General claims that the board of pharmacy created the offices named and that this action was sanctioned by the legislature when it provided for an annual tax upon druggists, and made it the duty of the secretary-treasurer to collect it. He also claims that the defendants went upon Spaulding's bond as sureties for the faithful performance of his official duties and that they are responsible for the amount of his defalcation. The case presents many legal technicalities and will be vigorously contested by both sides.

——Thomas L. Tuck, clerk for O. W. Jones, druggist, at Prospect and Independence avenues, Kansas City, Mo., was arrested on July 1 on the charge of selling strychnine to a 14-year-old boy who used the poison in an attempt to commit suicide.

——The tenth annual picnic of the Indianapolis Retail Drug Clerks was held at Dawson's Grove, near that city, recently. The athletic contests were an interesting feature.

New Discoveries in Crystallization.

As in everything else there has to be enthusiasts and conservatives in science, the former to make discoveries and the latter to discount them. There are a few meager details at hand in newspaper dispatches bearing upon recent alleged discoveries in crystallization which will accelerate the heart beats of the enthusiasts and cause hard breathing on the part of their opponents. Professor Von Schroen of Naples, claims to have discovered that all crystals are organic substances and has taken 2,800 photographs to show the transfer of organic into inorganic matter, some of these showing the successive phases of crystallization of albuminous substances to stone. Were it not that so many impossible things have become possible, there might be reason for thus early classing this alleged discovery as among the impossible, but it is perhaps wisest to wait awhile and see if our chemistry, physics, bacteriology and mineralogy must all be learned over again. It may be mentioned incidentally that there is a suggestion in the air that $500,000 be raised to assist the professor in further investigation.

From a Kansas city comes some intelligence which is apparently actively agitating the druggists of that place. It is to the effect that several local physicians have purchased a full drug stock and propose to soon open a co-operative drug store. Some of the physicians in the City Hospital are said to be stockholders in the enterprise. Perhaps some druggists may see in this scheme a sure prophecy of their own commercial ruin, but wait a little. It is nothing new, for there are many other cities which have the same sort of thing in operation, and the druggists are still living in spite of it. As a rule, the physicians who go into it are not patrons of the druggists any way, but dispense their own medicines, and are actuated principally by a desire for a little more financial benefit. In some cities it is quite the thing for a number of doctors to club together and hire a registered pharmacist to do their prescription compounding. But, nevertheless, any more of this sort has a serious significance which should not be disregarded. It is that there is some reason (what it is we do not hazard) why the druggists do not get the doctors' trade. Some portion of the cause may be the druggists', and our Kansas friends might possibly do well to inquire into their own responsibility, and see whether their house is duly swept and garnished.

It is reported that a Philadelphia drug clerk in mistake gave poison to a customer who asked for a headache cure, and that timely medical treatment was all that saved the victim's life. It is not disclosed what article was dispensed, but if it was one of certain proprietary or synthetic headache remedies which are in popular demand the presumption is warranted that no mistake was made by the clerk, as some of these articles are veritable poisons in improper doses or under improper conditions. It may turn out to be nothing but another one of the numerous cases of self prescribing and self dosing indulged in by the dear public, which have become alarmingly general during the past few years, and which frequently cause some startling and distressing results. Give the clerk the benefit of the doubt until he is proven guilty.

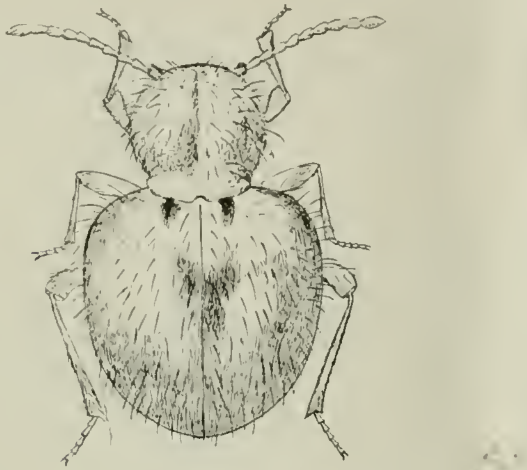
A newspaper item says that "many complaints have been made to the Territorial Board of Health that most, if not all of the druggists in New Mexico are violating the law regulating the practice of medicine, while earnestly soliciting the patronage of the physicians. If this is true, are the druggists an indispensable appendage to the doctors' equipment? Will the medicos be forced to return to the old custom of keeping their own drug supplies?"

There is a significance in this paragraph which the druggists should not disregard.

FOUND ANY "TRIGS" IN YOUR DRUGS?

A NEW COMMERCIAL PEST REPORTED FROM OREGON, WHERE IT LIVED IN CRUDE ARGOLS.

A new peril to drugs has been discovered by a correspondent (C. R.) in Oregon. This gentleman has a dye house among his customers and four years ago he purchased fifty pounds of crude argols, of which he sold ten pounds to the dye house. The remaining forty pounds was kept in tin cans. A year later these cans were opened, and were found to contain a few bugs about a tenth of an inch long and of a brown color. The boxes were closed air tight, according to the correspondent, and were not opened again for two years, when the contents were found to be a living mass of bugs. He sent a few specimens of the insect inclosed in a flat tin box, with some of the argols, to the Pharmaceutical Era to learn what the new pest was.



Crude argols is the name applied to the crude salts of tartar deposited on the sides of wine casks, and, as Benjamin G. Templeton, of the New York Tartar Company, in the Woodbridge Building, knows all about tartar, the specimens were shown to him. He had never heard of insects in crude argols, but an employé of his had seen something of the kind. His opinion was that the insects lived, not on the tartar, but on the sugar, albumin and other extraneous matter present. When he examined these bugs, however, he declared that they were not the same as he had seen, and he was unable to name them.

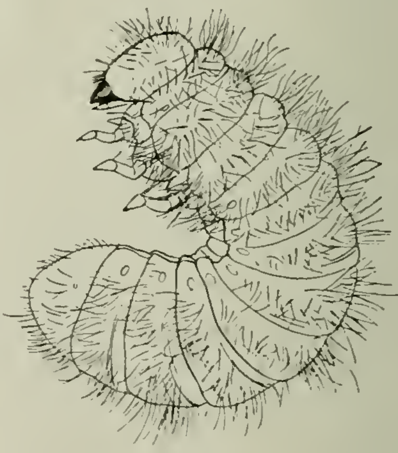
The samples were submitted to William Beutenmüller, Curator of the Department of Entomology, of the American Museum of Natural History, New York. Mr. Beutenmüller has an intimate acquaintance with every six legged inhabitant of this part of the United States, and can address each by name at sight, but the specimens submitted from Oregon puzzled him. He adjusted a jeweler's magnifying glass to his eye and brought the box of crawling, creepy little marauders up close under his nose. Then he got very much interested, sat down at his desk, with a pair of tweezers, took up one of the specimens, moistened it, smoothed it out lovingly and remarked:

"Brown in color, with bulbous body, distinctly piliferous; where have I seen that fellow before? It is very much like the drug store beetle in size, and a drug store beetle is what I should expect to find in such a habitat, but this insect is not at all the same shape as the drug store beetle. It is very evident that they shun the light." continued the naturalist as he gathered in two or three of the insects that had started on an exploration tour across his desk.

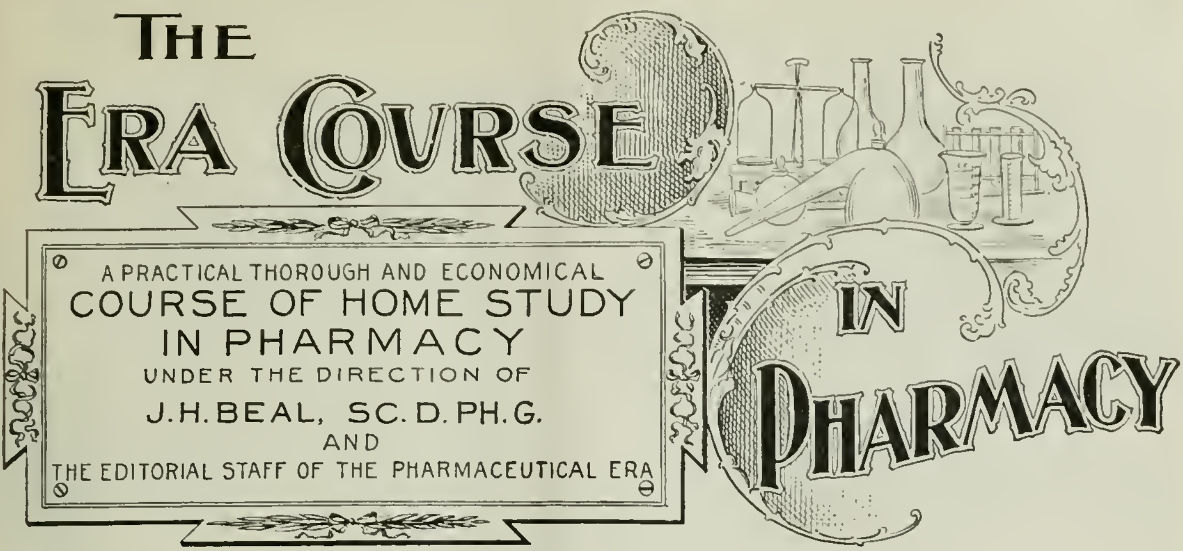
The upshot of it was that Professor Beutenmüller, who has a national reputation as an entomologist, was reluctantly forced to admit that he did not know the name of the insect, but he would find out. Some of the powder in which the bugs lived was mixed with water, but only a small part of it was soluble; the remainder consisted apparently of red, woody fiber as an impurity, on which probably the bugs had lived. After some time Prof. Beutenmüller identified the insects. Their name is Trigonogenius faretus, and they are of the family Ptinidæ. The Ptinidæ have a hard name, members of the same family being the drug store beetle, Sitodrepa panacea, and the tobacco beetle, Hasioderma serricorne. This new member of the family who has come into the drug business has not yet attracted much attention in its new field. John Leconte first described it from three specimens sent from San Francisco in 1865. Prof. Beutenmüller finds that a species of Trigonogenius has been recorded as an herbarium pest in California, and as there is only one of this species mentioned in the museum catalogue of Coleoptera (beetles) of North America, he at first concluded that this same beetle was the guilty party, but subsequent investigations proved that such was not the fact.

"Without much doubt," writes Prof. Beutenmüller, "this insect will live on all sorts of dry vegetable matter, like the drug store beetle, and it may in time become a serious pest to commercial products."

The "Trig" is not as prepossessing in appearance as his cousin, the drug store beetle, but like the bed bug, of which he is a minute imitation, he may get there just the same. The illustrations presented herewith show a very large magnification. They show the most noticeable characteristic of the insect in the retractile head which is located under the thorax or chest, like the spider's. Prof. Beutenmüller says that although these bugs developed from the powder found in wine casks, they are not the same kind of bug seen by people who drink too much wine. The latter are unknown in the drug business, where wine is kept for medicinal purposes only.



Druggist Wicks and Burkett of that aristocratic Chicago suburb, Evanston, are not in the least opposed to the personnel or the works of the Salvation Army, but they are opposed to some of its methods. Both druggists occupy good locations upon one of the pleasantest streets of the town and the surroundings are just suited to the army and volunteers for gathering crowds of an evening. So great were the crowds that patrons of the drug store soda fountains found it inconvenient to partake of their favorite beverages with peace and comfort, and the druggists were compelled to invoke the aid of the police who arrested the peace disturbers.



THE ERA COURSE IN PHARMACY

A PRACTICAL THOROUGH AND ECONOMICAL
COURSE OF HOME STUDY
IN PHARMACY
UNDER THE DIRECTION OF
J. H. BEAL, SC. D. PH. G.
AND
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UNIVERSITY EXTENSION APPLIED TO PHARMACY.

University Extension originated in England, and grew out of the desire to bring some of the advantages of higher education within the reach of those whose circumstances made university residence impossible. The central thought of the plan was to bring to the general public some knowledge of university methods and university ideals, and to afford a means of keeping in touch with the growth of ideas and of general scientific progress.

In America the plan has rapidly grown into public favor, though its development has been along lines differing somewhat from those laid down by its founders. Here it has resulted in the establishment of "Chautauquas," "Summer Schools," and "Correspondence Colleges," which are yearly increasing in numbers, attendance and influence, and are already among the most potent factors in the intellectual life of the time.

Like all innovations in educational methods, the plan at first met with strong opposition. It was argued that it would stimulate superficiality, that it would operate to the detriment of higher education by tempting young men and women to remain away from college, and that the whole scheme was visionary and impractical.

To the first objection it was replied that true education does not consist in simply memorizing a specified stock of supposed facts, but in the development and training of the faculties, and that mental development is quite possible outside of academic halls. To the argument that the success of the plan would diminish college attendance it was answered that the right way to stimulate a man's desire for higher education is to place some of it within his reach, and, finally that the plan is not to contract, but to extend the sphere of university influence, and to bring it into closer contact with the life and thought of the public to whose bounty it is indebted for the means of existence.

The work, at first actively taken up by the University of Chicago, has grown until there is scarcely an institution of prominence on the continent which is not directly or indirectly concerned in it. Those educators who at first stood aloof, fearing to lower the dignity of scholastic training by placing it within the reach of the masses, have learned their mistake, and are now, many of them, among its most enthusiastic supporters. Those institutions which feared that the popularizing of education would lessen public interest in the work of the college and university have learned that whatever increases a man's interest in general education increases his respect for collegiate training, and stimulates his desire to obtain its advantages for himself and his children. It has not only resulted in quickening the intellectual life of thousands to whom the doors of a university could never have been opened, but it has brought and is bringing increasing numbers of young men into the colleges who without its broadening influence would have remained satisfied with the meager equipment of the common school.

Aim of The Era Course in Pharmacy.

It is the aim of the Era Course to apply the scheme of University Extension to Pharmacy, and to bring to the many who are employed in that occupation some of the advantages of the university. It aims to enlist the sympathies not of a single university, but of all the leading schools and colleges of pharmacy in America. It aims to antagonize no existing institution, but to co-operate with all in the development and extension of pharmaceutical education in its highest and best sense.

In carrying out this plan it is realized that the Era has a varied constituency, and the effort will be made to furnish something of interest for every one.

For the beginner there will be a continuous series of lectures and recitations upon the elementary principles of the Theory and Art of Pharmacy in all its branches. For the scientifically inclined pharmacist there will be original contributions by accomplished investigators. For the druggist who is anxious to extend his sphere of usefulness there will be papers upon the subjects of profit which may legitimately be added to the business. For those who find commercial problems the most difficult to solve there will be solutions by those who have met the same problems and have solved them. For every one there will be something tending to make him more useful to his employment and his employment more useful to him.

BOOKS FOR THE ERA COURSE.

Very many intending students of this course have asked our advice relative to the books with which they should be supplied to most efficiently supplement the lectures. This general answer can be made to fit individual cases, replying to all inquiries of this nature.

At the outset it may be said that the student cannot have too many good books, but at the same time he can get along with but few. The main thing is to know how to use his books. Reading should be after some definite system, with some plain purpose in view. Desultory, unsystematic reference to books serves merely to load the mind with a lot of individual, unconnected, unrelated facts.

It is expected that the various lecturers will give all necessary advice regarding the choice of special works in connection with their subjects. But the student should have at least one good work on each of the main branches making up the science of pharmacy. These books will be of every-day service through the whole of the druggist's business life, and he cannot have too complete a working library. So our advice to students is to purchase as many standard, good books as they can afford.

GENERAL REFERENCE WORKS.

Stille, Maisch and Caspari. National Dispensatory. New 5th edition. Revised according to the Seventh Decennial Revision of the U. S. Pharmacopœia. Imperial 8vo., 2,205 pages. Full sheep, $8. Philadelphia: Lea Bros. & Co.

United States Pharmacopœia. Seventh Decennial Revision, 1894. 8vo. Cloth, $2.50 (post paid, $2.77).

Wood, Remington & Sadtler. United States Dispensatory. New 17th edition. Based on the Pharmacopœia of 1893. Royal 8vo., 1,930 pages. Full sheep, $8. Philadelphia: J. B. Lippincott Company.

GENERAL CHEMISTRY.

Attfield. Manual of General, Medical and Pharmaceutical Chemistry. 14th edition. 12mo., 794 pages, 88 illustrations. Cloth, $2.75. Philadelphia: Lea Bros. & Co.

Bartley. Medical and Pharmaceutical Chemistry. 4th edition. Revised and enlarged, 12mo., illustrated. Cloth, $2.75. Philadelphia: P. Blakiston, Son & Co.

Bloxam. Chemistry, Inorganic and Organic. Fifth American from 5th English edition. 8vo., 727 pages, 292 illustrations. Cloth, $2. Philadelphia: Lea Bros. & Co.

Clowes. Elementary Chemistry. Third American edition. 12mo., 387 pages, 55 illustrations. Cloth, $2.50. Philadelphia: Lea Bros. & Co.

Fownes' Chemistry. 12th edition with Watts' Inorganic Chemistry. 12mo., 1,061 pages, colored plate and 168 illustrations. Cloth, $2.75. Philadelphia: Lea Bros. & Co.

Mendeléef. The Principles of Chemistry. 2 vols., illustrated, 8vo. Cloth, $10. New York: Longmans, Green & Co.

Remsen. Introduction to the Study of Chemistry. Revised edition. 12mo., 435 pages. Cloth, $1.12. New York: Henry Holt & Co.

Remsen. Theoretical Chemistry. New 5th edition. 12mo., 326 pages. Cloth, $2. Philadelphia: Lea Bros. & Co.

Richter. Inorganic Chemistry. Fourth American, from the sixth German edition. 89 illustrations and colored plate of spectra, 12mo. Cloth, $1.75. Philadelphia: P. Blakiston, Son & Co.

Richter. Chemistry of the Carbon Compounds or Organic Chemistry. Second American, from 6th German edition. Illustrated, 12mo. Cloth, $4.50. Philadelphia: P. Blakiston, Son & Co.

The following list has been carefully compiled. It is not intended that one shall purchase all of the works named, but the leading books on each subject are named so that choice can be made at one's pleasure. Nor is it to be understood that this list embraces all the good books, though it is believed to be fairly comprehensive and representative.

The student should have the following:

U. S. Pharmacopœia.

Dispensatory (United States or National).

These will be useful, even indispensable, in the study of all the branches treated in the course.

From the following list he should select, if possible, one good work in each division:

Roscoe and Schorlemmer. Treatise on Chemistry. Illustrated.

Inorganic Chemistry, 8vo., Vol. I.—Non-metallic Elements, $5. Vol. II., Part I.—Metals, $3. Vol. II., Part II.—Metals, $3.

Organic Chemistry. 8vo. Vol. III., Part I.—Chemistry of the Hydrocarbons and Their Derivatives, $5. Vol. III., Part II.—The Same, $5. Vol. III., Part III.—The Same, $3. Vol. III., Part IV.—The Same, $3. Vol. III., Part V.—The Same, $3. Vol III., Part VI.—The Same, $3. New York: D. Appleton & Co.

Sadtler and Trimble. Text Book of Chemistry. 8vo., 950 pages. Cloth, $5. Philadelphia: J. B. Lippincott Co.

Simon. Manual of Chemistry. New 5th edition. 8vo., 502 pages, 44 engravings and 8 plates, illustrating colors of 64 important tests. Cloth, $3.25. Philadelphia: Lea Bros. & Co.

Wulling. Elementary Course in Inorganic Pharmaceutical and Medical Chemistry. 12mo. Cloth, $2. New York: John Wiley & Sons.

CHEMISTRY, INORGANIC.

Jago. Introduction to Practical Inorganic Chemistry; or, The Principles of Analysis. 12mo., 80 pages. Cloth, 45 cents. New York: Longmans, Green & Co.

Jago. Inorganic Chemistry, Theoretical and Practical. 78 wood cuts and colored plate of spectra. 12mo., 470 pages. Cloth, $1.50. New York: Longmans, Green & Co.

Newth. Text-Book of Inorganic Chemistry. Second edition. 146 illustrations, crown 8vo. Cloth, $1.75. New York: Longmans, Green & Co.

Remsen. Inorganic Chemistry. Revised edition. 872 pages, 8vo. Cloth, $2.80. New York: Henry Holt & Co.

QUALITATIVE ANALYSIS.

Cortman. Lessons in Analysis, Qualitative and Volumetric. 4th edition. Revised and enlarged, 295 pages. Cloth, $1.25. St. Louis:

Noyes. Elements of Qualitative Analysis. 8vo., 91 pages. Cloth, $4.50. Philadelphia: P. Blakiston, Son & Co.

Prescott and Johnson. Qualitative Chemical Analysis. A Guide in the Practical Study of Chemistry. Fourth edition. 8vo. Cloth, $3.50. New York: D. Van Nostrand Company:

Trimble. Practical and Analytical Chemistry. Fourth edition. Illustrated, 8vo. Cloth, $1.50. Philadelphia: P. Blakiston, Son & Co.

QUANTITATIVE ANALYSIS.

Curtman. Chemical Reagents, Their Purity and Preparation. 8vo., 256 pages. Cloth, $1.75. St. Louis:

Hartley. Course of Quantitative Analysis for Students. 12mo. Cloth, $1.25. New York: The Macmillan Company.

Hoffman and Power. Manual of Chemical Analysis. Third edition. 8vo., 621 pages, 179 illustrations. Cloth, $4.25. Philadelphia: Lea Bros. & Co.

Lyons. Pharmaceutical Assaying. 12mo., 154 pages. Cloth, $1.25. New York: D. O. Haynes & Co.

Schimpf. Text-Book of Volumetric Analysis. 12mo., 400 pages. Cloth, $2.75. New York: John Wiley & Sons.

Sutton. Volumetric Analysis. Seventh edition. Illustrated. Cloth, $4.50. Philadelphia: P. Blakiston, Son & Co.

PHARMACY.

Caspari. Treatise on Pharmacy. 8vo., 680 pages, 288 illustrations. Cloth, $4.50. Philadelphia: Lea Bros. & Co.

Coblentz. Handbook of Pharmacy. Second edition. Revised and enlarged. 572 pages, 437 illustrations, 8vo. Cloth, $4. Philadelphia: P. Blakiston, Son & Co.

Heebner. Manual of Pharmacy and Pharmaceutical Chemistry. Fourth edition. 12mo., 252 pages. Cloth, $2. New York: Published by the author.

Oldberg. Home Study of Pharmacy. Second revised edition. 8vo., 571 pages, 150 illustrations. Cloth, $3. Chicago: W. T. Keener Co.

Remington. Practice of Pharmacy. Third edition. 8vo., 1,448 pages, 600 illustrations. Cloth, $6. Philadelphia: J. B. Lippincott Co.

Stewart. Compend of Pharmacy. Fifth edition. 12mo. Cloth, 80 cents; interleaved, $1.25. Philadelphia: P. Blakiston, Son & Co.

BOTANY.

Bastin. College Botany. Second Revision. 8vo., 451 pages, 600 illustrations. Cloth, $2.50. Chicago: G. P. Engelhard & Company.

Bessey. Botany. Revised edition. 8vo., 611 pages. Cloth, $2.20 net. New York: Henry Holt & Company.

Gray. Lessons in Botany. 12mo., 226 pages. Cloth, 95 cents. New York: American Book Company.

Vines. Student's Text-Book of Botany. Complete in one volume. 8vo. Cloth, $3.75. New York: The Macmillan Company.

MATERIA MEDICA, THERAPEUTICS AND PHARMACOGNOSY.

Bartholow. Treatise on Materia Medica and Therapeutics. Ninth edition. 8vo. Cloth, $5. New York: D. Appleton & Co.

Farquharson. Therapeutics. Fourth American from fourth English edition, revised by Frank Woodbury, M. D., with additions embracing the U. S. Pharmacopœia. 12mo., 551 pages. Cloth, $2.50. Philadelphia: Lea Bros. & Co.

Culbreth. Manual of Materia Medica and Pharmacology. 8vo. 818 pages, 455 illustrations. Cloth, $4.75. Philadelphia, Lea Bros. & Co.

Flückiger and Tschirch. Principles of Pharmacognosy. Translated by Power. 8vo., 294 pages, 186 illustrations. Cloth, $3. New York: Wm. Wood & Co.

Maisch. Manual of Organic Materia Medica. New 6th edition. 12mo., 509 pages, 285 illustrations. Cloth, $3. Philadelphia: Lea Bros. & Co.

Potter. Handbook of Materia Medica, Pharmacy and Therapeutics. Sixth edition. 8vo. Cloth, $4.50. Philadelphia: P. Blakiston, Son & Co.

Rusby and Jelliffe. Essentials of Vegetable Pharmacognosy. 8vo., 149 pages, 560 illustrations. Cloth, $2.50. New York: D. O. Haynes & Co.

Sayre. Organic Materia Medica and Pharmacognosy. 8vo., 555 pages, 543 illustrations. Cloth, $4. Philadelphia: P. Blakiston, Son & Co.

Wall. Notes on Pharmacognosy. 12mo. Cloth, $1.50. St. Louis: Meyer Bros. Drug Company.

White and Wilcox. Materia Medica, Pharmacy, Pharmacology and Therapeutics. Second edition. 12mo., 660 pages. Cloth, $3. Philadelphia: P. Blakiston, Son & Co.

BACTERIOLOGY.

Hueppe. Methods of Bacteriological Investigation. 8vo., 218 pages, 31 illustrations. Cloth, $2.50. New York: D. Appleton & Co.
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Schenk. Manual of Bacteriology. Translated from the German by W. R. Dawson, B. A., M. D. 100 illustrations, 8vo. Cloth, $3. New York: Longmans, Green & Co.

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Gage. Microscope and Microscopical Methods. Fifth edition. 8vo., 103 figures. Interleaved. Cloth, $1.50. Ithaca: Comstock Publishing Co.

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Lippincott's Medical Dictionary. By Greene, Piersol, Ashhurst and Remington. 8vo., 1,160 pages. Cloth, $7. Philadelphia: J. B. Lippincott Co.

Martin. The Human Body. Briefer Course. 377 pages, 12mo. Cloth, $1.50. New York: Henry Holt & Co.

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CORROSIVE SUBLIMATE IN CALOMEL.*

BY LYMAN F. KEBLER.

The 1890 U. S. P., among other requirements, describes calomel as "A white, impalpable powder, showing only small, isolated crystals under a magnifying power of 100 diameters. Insoluble in water, alcohol or ether. In contact with calcium hydrate T. S., the salt is blackened. If 1 gramme of the salt be shaken with 10 cc. of water or alcohol, the respective filtrates should not be affected by hydrogen sulphide T. S. or silver nitrate T. S. (absence of mercuric chloride)."

Several years ago the writer received a sample of calomel that gave a prominent yellow coloration when treated with lime water. Yellow wash instead of black wash, if you please. The question immediately arose—is it possible that any manufacturer will put such a valuable medicinal agent as calomel on the market containing such an apparent quantity of corrosive sublimate? Further examination showed that the calomel contained an appreciable quantity of this poisonous agent. Other makes were secured and all developed a greater or lesser yellowish coloration when treated with lime water. The various available products were then critically examined according to the U. S. P. requirements, with the following results. The color varied from a white to a decided cream. Isolated broken crystals were present in all material examined. Minute traces of mercuric chloride were indicated in every instance.

Since examining the above samples the writer has watched the quality of this article with much interest; but thus far all efforts have failed to find a calomel absolutely free from corrosive sublimate when the U. S. P. tests were rigidly applied. In two cases, however, both the silver nitrate and the hydrogen sulphide failed to give absolute evidence of the mercuric chloride, but a transitional yellow was developed with even these when treated with lime water. One of these was a beautiful crystalline (plates) product of Japanese origin, the other an old sample found in the laboratory.

Several questions arise in this connection. First, the yellowish coloration, and second, the relative solubilities of mercurous chloride, silver chloride and mercurous sulphide.

It is well known that the color of the various compounds of mercury is readily modified. In precipitating mercuric mercury with hydrogen sulphide, the resulting product frequently varies in color from white to black. The writer on several occasions has repeatedly washed calomel with water, to remove the soluble mercury compounds, but in every instance a yellowish coloration was developed at the point of contact, when the washed calomel was treated with lime water. This would suggest the conclusion that calomel develops a transitional yellowish coloration at the point of contact when treated with lime water.

The second question, viz.: the relative solubility of the above-named compounds, is an interesting one. We are informed by the Pharmacopœia, and other standard works, that calomel is insoluble. Silver chloride and mercurous sulphide are generally considered insoluble. According to A. M. Comey's "Dictionary of Chemical Solubilities" calomel and silver chloride are nearly or almost insoluble in water, while mercurous sulphide is insoluble.

F. Kohlrausch[1] and F. Rose, calculating from the electrical conductivity of calomel in water, at 18° C., have found that 1 litre of water dissolves 3.1 mg. of mercurous chloride. The same authorities[2], by the electrolytic method, have found that 1 litre of water, at 18° C., dissolves 1.52 mg. of silver chloride. The difference of the relative solubilities of silver chloride and mercurous chloride is 1.58 mg. per litre. According to these experiments, there would be formed a certain amount of silver chloride, when a saturated aqueous solution of calomel is treated with silver nitrate. When we remember that one part of silver can be detected in 800,000 parts of water, it can readily be seen why calomel is so often reported as containing corrosive sublimate.

Then again, if mercurous chloride is soluble at all in water, and mercurous sulphide is insoluble in the same menstruum, it naturally follows that hydrogen sulphide will produce a reaction with a saturated aqueous solution of calomel.

According to the writer's observations, calomel is nearly as soluble in alcohol as in water, but is insoluble in ether; at least, an alcoholic solution of calomel frequently gives a reaction with hydrogen sulphide, while an ethereal solution will not leave a residue when evaporated in a pure atmosphere.

While it is impossible to countenance any laxness in a matter of this kind, still the writer is of the opinion that the official requirements are slightly too rigid. As the matter now stands, the analyst must practically take it upon himself, if he reports favorably on any material submitted, or he must reject every sample submitted to him. Calomel does occasionally contain corrosive sublimate, and it is necessary to keep a strict surveillance over this product. But according to the most rigid tests, with the above noted exception, all calomel examined by the writer during the past few years has not contained over $^1/_{100000}$ of 1 per cent. of corrosive sublimate.

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*Presented at the meeting of the Penna. Pharm. Assoc., June, 1897. Reprinted in Amer. Jour. Pharm.

[1] 1893, Ztschr. Phys. Chem., 12.241.

[2] 1893, Ibid,, 12.242.

The Liquefaction of Fluorine.*

The physical properties of a large number of mineral and organic fluorine compounds led to the theoretical prediction that the liquefaction of fluorine could only be accomplished at a very low temperature.

While the chlorides of boron and silicon are liquids at the ordinary temperature, the fluorides are gaseous, and well removed from their boiling points. The same difference is noticeable in their organic compounds, ethyl chloride boiling at 12°, ethyl fluoride at —32°, propyl chloride boiling at + 45°, ethyl fluoride at —2°.

Similar observations have been previously made by Paterno and Oliveri, and by Vallach and Heusler. These facts can also be connected with the experiments of Gladstone on atomic refraction. Finally, although clearly a member of the chlorine group, fluorine in some of its properties also presents some analogies to oxygen. The whole of these observations appear to clearly establish that fluorine would only with difficulty be reduced to a liquid, and it has already been shown by one of us that at —95°, under ordinary pressure, it does not change its state.

In the new experiments that we now publish the fluorine was prepared by the electrolysis of potassium fluoride in solution in anhydrous hydrofluoric acid. The fluorine gas was freed from the vapors of hydrofluoric acid by passing it through a small platinum spiral cooled by a mixture of solid carbon dioxide and alcohol. Two platinum tubes filled with well dried sodium fluoride completed this purification. The liquefaction apparatus consisted of a small cylinder of thin glass, to the upper part of which was joined a platinum tube. The latter contained another small tube of the same metal. The gas to be liquefied arrived by the annular space, passed into the glass bulb, and passed out again by the inside tube. This apparatus was united to the tube which led in the fluorine.

In these experiments we have used liquid oxygen as the refrigerating substance. This oxygen was prepared by the methods described by one of us, and these researches have necessitated the employment of several liters of this liquid. The apparatus being cooled to the temperature of quietly boiling oxygen (—183°), the current of fluorine gas passed into the glass bulb without liquefying; but at this low temperature the fluorine had lost its chemical activity, and no longer attacked glass.

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*"On the Liquefaction of Fluorine," by H. Moissan and J. Dewar. Translated by Nature from Comptes rendus of the Paris Academy of Sciences. Reprint from Scientific American.

If now the pressure on the boiling oxygen be reduced, it is seen, as soon as rapid ebullition is produced, that a liquid trickles down the walls of the glass bulb, while no gas issues from the apparatus. At this moment the exit tube is closed with the finger to prevent the entrance of any air. Before long the glass bulb becomes filled with clear yellow liquid possessing great mobility. The color of this liquid recalls the tint of fluorine seen through a layer a meter thick. According to this experiment, fluorine becomes a liquid at about —185°. As soon as the little condensation apparatus is removed from the liquid oxygen, the temperature rises and the yellow liquid begins to boil, furnishing an abundant evolution of a gas which presents all the energetic reactions of fluorine.

We have taken advantage of these experiments to study some of the reactions of fluorine upon bodies maintained at very low temperatures. Silicon, boron, carbon, sulphur, phosphorus, and reduced iron, cooled in liquid oxygen, and then projected into an atmosphere of fluorine, do not become incandescent. At this low temperature, fluorine does not displace iodine from iodides. Its chemical energy, however, is still sufficiently great to decompose turpentine or benzine with production of flame even at —180°. It would seem that the powerful affinity of the fluorine for hydrogen is the last to disappear.

Finally, there is one other experiment that we ought to mention. When a current of fluorine gas is passed into liquid oxygen, there is rapidly produced a white flocculent deposit, which soon settles at the bottom of the vessel. If the mixture is shaken and poured on a filter, this precipitate is separated. It possesses the curious property of deflagrating violently as soon as the temperature rises. We are pursuing the study of this compound, as well as that of the liquefaction and solidification of fluorine, in which further experiments are required.

THE THERAPEUTIC VALUE AND ADMINISTRATION OF IRON.

By ROBERT C. KENNER, M. D., Louisville, Ky.

It is the purpose of the writer to go over the therapeutic preparations of iron, and to give what is considered the best means of exhibiting so important a remedy. While the profession fully values iron, there is no doubt that failure to obtain the results which this agent is capable of rendering is often due to the fact that a preparation is employed which is not readily assimilated. When taken into the mouth the soluble preparations of iron exert an astringent effect. Iron, as is well known, is one of the proximate principles of the economy and is an essential part of the food. A great many of the ordinary preparations produce constipation. Iron is a tonic which exerts a marked influence on the nerve centers, but the good results which we obtain from it are the improvement it makes in nutrition. In anæmia it increases the number of blood corpuscles, and is, therefore considered a specific for that affection. The hæmoglobin of the blood is brought up to the healthy standard under its use. By the improvement in the quality of the blood, the heart's action becomes better, and anæmic patients, who, before its administration, suffered with palpitation and frequent attacks of syncope, soon lose these symptoms after getting under its influence. The stomach is usually stimulated and the appetite is improved, when a pure non-irritating preparation is exhibited. Binz says, "The contact of the latter (iron) with the mucous membrance causes a certain amount of constipation. If a solution of iron be injected into the blood of an animal, the metal soon appears in abundance as albuminate on such secreting surfaces as generally pour out albuminate secretion. The reason of this is the blood corpuscles in every part of the body assimilate the albuminate of iron, if its particles be sufficiently minute."

The field in which iron is employed with greatest confidence is where we have anæma—and it is a specific for this affection when it is given in a form acceptable and easily assimilable. In chlorosis it is also given with excellent results. Fothergill lays down this rule as one indication for the exhibition of iron: "When the tongue is dry and red, iron always disagrees and should not be ordered. On the other hand, a pale broad and flabby tongue is especially indicative of the demand of the system for iron." (Shoemaker.)

In amenorrhœa iron is given with decided benefit, and when this trouble is due to anæmia the action of the remedy is pronouncedly favorable. To get the best results it must not only be given in appropriate form but regularly. This point is especially mentioned because in many cases where the action of the iron is not seen after the drug has been taken for a time it is due to the fact that the preparation has not been faithfully taken by the patient. In chlorotic girls this is often the case, and the practitioner must endeavor to get the parents of the patient to aid him.

In the treatment of enlarged spleen due primarily to the action of malaria, the effect of iron is generally most beneficial—probably because it overcomes the anæmia usually associated. In the treatment of neuralgia iron may be effectively employed in a great many cases, since that affection very often results from anæmia. In persons subject to attacks of articular and muscular rheumatism, we often find great improvement after a course of iron. In syphilis it is frequently given with much benefit, especially when anæmia is a marked feature. It may be said in a general way that iron is indicated in pure anæmia, and in all other affections in which that condition is a factor. To administer iron properly is of a degree of importance which we cannot overestimate. The giving of the old tincture of the chloride is open to many objections. That preparation is very disagreeable to the palate, and often produces gastric disturbance, constipation and other diseases. The albuminate of iron is considered by the ablest men in the profession as the most available preparation, as it is readily absorbed, and we can depend upon it to produce the best results. Liq. Ferri Albuminati (Drees) is a common form of prescribing it. This remedy is prepared with extreme care, and it does not prove disappointing, as is too often the case with other remedies of this class. (Notes on New Remedies.)

VOLUMETRIC ESTIMATION OF BORIC ACID IN GAUZES.—Beckurts and Dauert (Ap. Ztg.) direct as follows: 5 gm. of the finely cut gauze are agitated with 400 cc. of a mixture of glycerin (1 p.) and water (19 p.) contained in a 500 cc. flask; later sufficient of the solvent is added to make the volume up to 500 cc. From the clear fluid 100 cc. are drawn off, and with the addition of phenol-phtalein and some glycerin, titrated with N-10 sodium hydrate solution. The number of cc. of N-10 sodium hydrate solution required, when multiplied with 0.0062, gives the quantity of boric acid found in 1 gm. of the gauze; when multiplied by 100 the percentage content is obtained. The quantity of glycerin added during titration is regulated by the appearance of alkalinity, for as soon as the solution shows an alkaline reaction glycerin is added; this is followed usually at first by disappearance of the red color until actual neutralization has taken place. If sufficient glycerin is added the color reactions are sharp. The reaction is as follows in presence of glycerine: $B_2O_3 + 2NaOH = 2NaBO_2 + H_2O$.

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Alcohol (deod.), 96 per cent., 25 liters; distilled water, 5 liters; oil of neroli (Bigar.), 100 gm.; oil of neroli (Portug.), 100 gm.; oil of petit grain (Bigar.), 100 gm.; limette oil, 100 gm.; cedrat oil, 100 gm.; lemon oil, 100 gm.; bergamot oil, 100 gm.; oil of rosemary, 35 gm.; oil of lavender flos., 20 gm.; oenanthic ether, 100 drops. (It is unnecessary to caution the reader that only the finest grades of oils should be employed.)

Eau de Cologne (4711).

Alcohol (deod.), 96 per cent., 10 liters; distilled water, 1 liter; oil of bergamot, 43 gm.; limette oil, 38 gm.; cedrat oil, 25 gm.; oil of lavender flowers, 12 gm.; oil of neroli (Bigar.), 28 gm.; oil of petit grain, 30 gm. (Bigar.); oil of geranium (Afric.), 12 gm.; oil of jasmine, 10 gm.; oil of rose, 2 gm.; aqua ammonia (10 per cent.), 10 gm.

Eau de Cologne (Rudolfsplatz).

Cologne spirits, 125 liters; distilled water, 30 liters; oil of lemon, 1,000 gm.; oil of bergamot, 1,000 gm.; oil of neroli (Bigar.), 500 gm.; oil of petit grain (Bigar.), 125 gm.; oil of lavender flos, 90 gm.; oil of rosemary ff., 40 gm.; otto of rose, 30 drops.

Violet Cologne.

Eau de Cologne (Rudolfsplatz), 10 kilos; cologne spirits, 1 kilo; distilled water, 1 kilo; liquid oil of orris, 20 gm.

Maybell Eau de Cologne.

Eau de Cologne (Rudolfsplatz), 10 kilos; cologne spirits, 1 kilo; distilled water, 1 kilo; oil of linaloe, 100 gm.; essence of apples, 10 gm.

Eau de Lavande I. (white).

Cologne spirits, 5,000 gm.; distilled water, 1,500 gm.; oil of lavender flos., 85 gm.; oil of lemon, 10 gm.; oil of petit grain, 20 gm.; oil of geranium, 5 gm.; Musk, Bauer's, 1 gm.; tincture of Zilbeth, 25 gm.

Hair Tonics.

Eau de Quinine I.

Alcohol (96 per cent.), 5.500 gm.; water, 3,750 gm.; rosewater, 3.750 gm.; orange flower water, 3,750 gm.; tincture of tonka, 140 gm.; tincture of benzoin, 160 gm.; tincture of musk, 3 gm.; tincture of cinchona, 600 gm.; glycerin, 600 gm.; oil of orange, 6 gm.; oil of lemon, 20 gm.; oil of bergamot, 12 gm.; oil of geranium (African), 20 gm.; oil of petit grain, 12 gm.; oil of lavender flos., 24 gm.; oil of orris, 1 gm.

Eau de Quinine II.

Alcohol (96 per cent.), 2,500 gm.; castor oil, 200 gm.; tincture of cinchona, 200 gm.; Eau de Cologne, 500 gm.; extract of heliotrope, 60 gm.; extract Reseda, 60 gm.; orange flower water, 250 gm.; tincture of catechu, 50 gm.

Eau de Quinine III.

Alcohol (96 per cent.), 3,000 gm.; tincture of galls, 400 gm.; tincture of cinchona, 400 gm.; tincture of vanilla, 200 gm.; glycerine, 200 gm.; an infusion of 1,000 gm. Panama wood in 3,000 gm. of water added, followed by oil of bergamot, 40 gm.; African oil of geranium, 20 gm.; oil of clove, 10 gm.

Tooth and Mouth Washes.

Eau Anatherine.

Guaiac wood, 100 gm.; myrrh, 250 gm.; cloves, 150 gm.; sandal wood, 150 gm.; cinnamon, 50 gm.; oil of mace, 5 gm.; otto of rose, 5 gm.; oil of cinnamon, 5 gm.; alcohol, 4 liters; rosewater, 2 liters. Macerate 14 days and filter.

Eau Dentifrice.

Tincture of cedar, 4 liters; tincture of rhatany, 1 liter; tincture of myrrh, 1 liter; oil of lavender, 20 gm.; oil of peppermint (Mitcham), 30 gm.; otto of rose, 10 gm.

Eau de Menthe.

Alcohol (90%)	1 liter
Rosewater	135 grams
Sugar	13 grams
Glycerin	27 grams
Peppermint oil (Mitcham)	27 grams

Eau de Eucalyptus.

Alcohol (60%)	500 grams
Oil of eucalyptus	20 grams
Oil of clove	2 grams
Oil of peppermint	2 grams

Salicylic Mouth Wash.

Alcohol (96%)	6 kilos
Water	2½ liters
Peppermint oil	85 grams
Oil of anise	20 grams
Salicylic acid	20 grams
Red tincture	20 grams
Yellow tincture	20 grams

Tooth Tincture I.

Alcohol (96%)	850 grams
Glycerin	80 grams
Tincture cinchona	50 grams
Tincture myrrh	10 grams
Tincture guaiac	25 grams
Oil of clove	3 grams
Oil of peppermint	5 grams

Tooth Tincture II.

Tincture of rhatany	125 grams
Tincture myrrh	125 grams
Eau de Cologne	750 grams

Tooth Wash.

Alcohol (96%)	5000 grams
Water	1000 grams
Sugar	200 grams
Salicylic acid	15 grams
Powdered cinnamon	160 grams
Powdered cloves	150 grams
Tincture cochineal	30 grams
Tincture vanilla	50 grams
Oil of peppermint	75 grams
Tincture of alkanet	50 grams
Oil of anise	30 grams
Oil of bergamot	15 grams
Oil of lemon	15 grams
Oil of clove	10 grams

Odontine I.

Powdered oyster shell	720 grams
Powdered pumice	3 grams
Powdered soap (castile)	15 grams
Powdered orris	9 grams
Carmine	2 grams
Glycerin	6 grams
Syrup	6 grams
Oil of peppermint	30 drops
Oil of clove	3 drops

Oils to be dissolved in 4 grams of alcohol.

Odontine II.

Powdered castile soap	2 kilos
Finest levigated chalk	2½ kilos
Powdered oyster shell	2½ kilos
Magnesium oxide	2 kilos
Finest talc	2 kilos
Syrup	1 kilo
Glycerin	1 kilo
Water	1 kilo
Powdered acacia	500 grams
Carmine	30 grams
Tartaric acid	30 grams
Powdered borax	50 grams
Oil of peppermint (German)	60 grams
Oil of peppermint (Mitcham)	80 grams
Oil of lemon	10 grams
Oil of clove	12 grams

Cinchona Tooth Powder I.

Powdered cinchona bark	250 grams
Powdered milk sugar	250 grams
Sandalwood charcoal	65 grams
Powdered castile soap	65 grams
Oil of peppermint (Mitcham)	8 grams
Oil of calamus	8 grams

Cinchona Tooth Powder II.

Powdered calx usta	250 grams
Powdered orris root	125 grams
Rice starch	130 grams
Quinine sulphate	3 grams

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*Selected from a list of formulæ published in the Pharm. Post.

Sepia Powder.

Calcined chalk	250 grams
Powdered os sepia	125 grams
Powdered orris root	125 grams
Carmine	4 grams
Oil of lemon	15 grams

Red Tooth Powder.

Sodium salicylate	50 grams
Sugar powdered	50 grams
Sodium bicarbonate	50 grams
Powdered orris root	50 grams
Powdered sandalwood	250 grams
Oil of peppermint (Mitcham)	50 grams

Salicylic Tooth Powder.

Sugar of milk	600 grams
Powdered castile soap	10 grams
Tincture of musk	10 grams

(No salicylic acid.)

(To be continued.)

DRUG INTERESTS OF ST. LOUIS.

George B. Simpson, of Meyer Bros. Drug Company, recently prepared an interesting article with reference to the drug interests of St. Louis and future prospects, in which he says "That St. Louis is one of the most important drug markets of America is an acknowledged fact all over the civilized world. There is more capital invested in the drug and allied industries of St. Louis than in any other city of the country, and the volume of business transacted annually makes the drug interests of St. Louis a distinguishing feature of the city's prosperity. The progress has not been of mushroom growth, but slow and steady, as is evidenced by the fact that as early as 1855 there were fourteen wholesale drug houses in St. Louis, in addition to a number of manufacturers in lines appertaining to the drug business. St. Louis, even at that early date, was the distributing center for the entire Northwest, West, South and Southwest, the principal shipments being made by water. The river traffic was enormous and some of the Missouri and Mississippi River steamers were models of their kind. At that time there were few wholesale drug firms west of the Mississippi, owing to the lack of proper railroad facilities, but now nearly every large city in the West and South has at least one. The conditions then existing in St. Louis have since changed and the number of drug houses decreased. At present there are but five, but they are perfectly capable of looking after the interests of the drug trade for some years to come, and compare most favorably with any in the United States.

"St. Louis is extremely fortunate in being centrally located and having unsurpassed transportation facilities, which enables her merchants to compete successfully with firms in any section of the country. While the merchants of nearly every section have been more or less affected by the depressed conditions of trade during recent years, the St. Louis druggists have increased their business very materially and have cause to congratulate themselves on the excellent showing made. Every indication points to an era of increased prosperity. The following is taken from a review of the commercial interests of St. Louis, compiled by Mr. Geo. H. Morgan, secretary of the Merchants' Exchange, and is considered reliable:

"'In the manufacturing of chemicals, St. Louis is a great deal ahead of any other city, and in the wholesale drug and proprietary medicine business it stands second only to New York. The amount of capital invested in this business has been increased considerably during the year, although the amalgamation of two houses has somewhat reduced the number of firms engaged in the business. The five large houses have more than 30,000 regular customers; these are located throughout the West, Southwest and South, with many regular buyers east of the Mississippi River. In addition to this heavy shipments have been made during the year to foreign points, with a marked increase in the demand from Mexico and Central America.'"

"One drug firm in St. Louis has the distinction of being the largest in the world and has a capital of $1,750,000 invested in its business. Another firm engaged in the manufacture of chemicals exclusively is now recognized to be the largest in the United States and its fame has spread to every part of the world. The proprietary medicine interests, which can be rightly classed with the drug interests, have assumed enormous proportions and there is without doubt more money invested in the manufacture of these goods in St. Louis than in any other city in the Union. Without exception all of the drug interests of St. Louis are in excellent condition, and the proprietors are classed among the most substantial business men of the metropolis, filling high positions of trust. While they are conservative, they are awake to every opportunity for increasing their business, and it is this progressive spirit, coupled with their conservatism and the natural advantages possessed by St. Louis that has made it the greatest drug market in America. The drug business between St. Louis and our sister republics is constantly increasing, and it will not be long before Mexico, the Central American Republics, the West Indies and South America will look to St. Louis as their source of supplies. It is the natural gateway for supplying the West and has a larger radius of territory dependent upon her than any other city. In the drug business quick shipments are necessary, and it is a recognized rule with the St. Louis jobbers to make their shipments on the same day that the order is received. Very rarely is there any exception to this rule, which fact is evidently appreciated by the Western drug trade. They vie with each other in anticipating the wants of their patrons, and while there is considerable honest rivalry amongst them, they never speak disparagingly of their competitors and remain upon the most friendly terms. They discourage the demoralization of prices by cut rate stores, recognizing the fact that legitimate profits are necessary in conducting a successful business, and feeling that their interests are identical with those of their patrons. The drug trade of St. Louis is ever destined to be one of her principal industries. With the entire West increasing in population it is safe to say that within a short time the business will have assumed proportions never thought of by the concerns doing business in 1855 or even later. Some of the larger St. Louis drug firms have been represented in the Eastern markets for many years. Owing to their large importation business it is absolutely necessary to retain a competent force there who watch the markets very carefully. Nearly all of the drug-buying is attended to by experienced Eastern representatives who examine the goods carefully before shipments are made. Direct importations are received daily from all parts of the world and the export business is assuming most gratifying proportions. The citizens of St. Louis are very proud of its drug interests and the men engaged in this business. Visitors are shown over the mammoth establishments with pride, and whenever the leading industries are mentioned, the drug interests are not forgotten. Another industry which is so closely related to the drug business is the manufacture of perfumes and toilet requisites. During the year 1895 this assumed enormous proportions, one firm alone importing thousands of pounds of French pomades to be used in the manufacture of handkerchief extracts. The bulk of perfumeries and toilet articles manufactured are sold by the drug trade and are very properly a part of the legitimate drug business, hence the manufacture of this class of goods cannot but increase the fame of St. Louis as a drug market. There are a number of firms now engaged in this business in St. Louis, and owing to the excellence of their products they have gained a foothold and splendid reputation in Eastern markets."

CARNIFERRIN.—A patented iron phosphate compound which contains 35 per cent. of iron and is free from the disturbing influences of other iron preparations. It forms a red-brown, inodorous powder which is given in doses of 0.2 to 0.5 gm.

PHARMACY.

PHENANIMUM.—A commercial title for phenocoll pur.

COLLAFORM.—A powd. formaldehyde gelatin used as antiseptic.

HÆMOTROPIN.—A permanent, pleasant preparation of hæmoglobin.

HÆMALBUMIN (Hell).—This blood albuminoid compound contains 25 per cent. of iron.

ACETOCAUSTIN.—A caustic, which consists of a 50 per cent. solution of trichlor-acetic acid.

OZALIN.—A disinfectant consisting of a mixture of ferrous sulphate, magnesia and caustic lime.

STERIFORM, STERISOL, GOLZINOL AND GOLZIN are various titles for preparations of formaldehyde.

TRIPHENAMIN.—A mixture of 2.6 gm. of phenocoll, 1 gm. of phenocoll salicylate and 4 gm. of phenocoll acetate.

HELMINTHEN EXTRACT.—An anthelmintic extract prepared from the extracts of various vegetable anthelmintics, with vanillin as flavoring agent.

RAPHANOL.—A crystalline body isolated from the tubers of the Raphanes niger, also found in radish, turnip and other members of this family.

PARACHLOROPHENOL PASTE.—An ointment containing equal parts of vaseline, lanolin, starch and para-chloro-phenol, used in treatment of lupus.

DEXTROFORM.—A soluble antiseptic powder, a compound of dextrin and formaldehyde, which gives off formaldehyde more readily than its analogue amyloform.

LIPASE.—A ferment found in the blood and liver, which possesses saponifying properties for fats to a high degree. When heated to 90° C. the ferment is destroyed.

SYRUP OF CODEINE.—Messrs. Knoll & Co. recommend the phosphate of codeine for preparing the syrup, since it is the most soluble of all the salts of this alkaloid.

ARTIFICIAL GLYCERIN.—A mixture has appeared in the market consisting of a solution of calcium chloride and glucose, of gravity and consistence near that of glycerin.

EUCALYPTEOL.—A strong antiseptic, crystalline product of the volatile oil of eucalyptus, which is given in doses of 1.5 to 2 gm. in tuberculosis, bronchitis and influenza.

PHOSPHATOL.—A thick, dark colored fluid consisting of a mixture of phosphoric ether and creosote, boiling between 140° and 141° C. With ferric chloride, phosphatol gives a red color.

BARAROL.—A clear, reddish brown, oily fluid of aromatic tarry-like odor; its aqueous solution has an alkaline reaction. Recommended as a disinfectant in 5 per cent. aqueous solution.

WRITING ON OR COLORING CELLULOID.—Kuwert has patented the use of acetic anhydride as a solvent for the various colors used in staining, stamping or writing on celluloid. It possesses the advantage over glacial acetic acid in that the colors are not affected by atmospheric influences.

DI-CODEIN-METHANE-CHLORIDE.—The hydrochloride of a compound obtained by the action of formaldehyde on codeine. The product is readily soluble in water and alcohol; it melts at 140° C.

GLANDULEN.—An organotherapeutic preparation of the bronchia of the sheep. The glands are sterilized, cleansed, dried and powdered with sugar of milk and made into tablets. Used in tuberculosis.

GUAIACETIN (Pyrocatechin acetic acid).—A white inodorous powder, melting at 130° C.; when heated between 140° and 150° C., water separates and a lactone of melting point 56° C. forms. Given in doses of 0.5 gm. in tuberculosis.

NICKEL-PLATING BATH.—Sulphate of nickel and ammonium, 725 gm.; ammonium sulphate, 225 gm.; citric acid, 50 gm., are dissolved successively in 12 liters of water, raised to a boil and filtered. The bath must have a faint acid reaction.

PHOSPHO-GUAIACOL.—A crystalline body obtained by the action of phosphorus chloride on guaiacol in presence of caustic soda. It possesses a sharp taste, but is not caustic. It is somewhat soluble in water, alcohol and fatty oils.

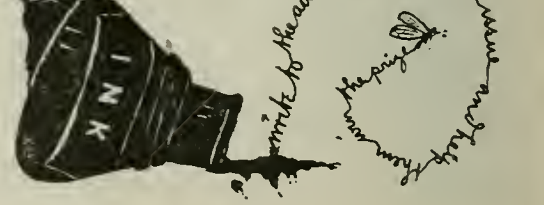
FIRE EXTINGUISHING FLUID.—A mixture of 50 p. of sodium chloride, 30 p. of sodium bicarbonate and 20 p. of alum is prepared, and 6 p. of this dissolved in 100 p. of water. When thrown upon a burning object the fluid leaves a non-combustible coating.

HOLOCAIN p-dieth-oxy-ethylene-diphenyl-amidin).—A crystalline insoluble (water) base, which is recommended as a substitute for cocaine. Used in form of its hydrochloride, producing total local anæsthesia; when used subcutaneously it produces temporary toxic symptoms.

SANOFORM (Di-iodo-salicylic-methyl-ester).—A white, inodorous, non-toxic substitute for iodoform, which on standing exposed to the light undergoes decomposition. Sanoform is especially adapted to treatment of syphilitic sores, either in form of a dusting powder or ointment.

PSILOTHINUM.—A depilitant possessing the consistency of a cerate, applied with a hot flat piece of metal and then allowed to cool, after which it is removed with the superfluous hair adhering. The remedy consists of a mixture of 40 per cent. of Elemi balsam, 10 per cent. of benzoin, 8 per cent. of rosin, 10 per cent. of yellow wax and 30 per cent. of diachylon plaster.

TWO NEW JABORANDI ALKALOIDS.—Messrs. Petit and Palonouski obtained from a new variety of the Jaborandi (Pilocarpus spicatus) 0.3 per cent. of a mixture of two alkaloids, one they named pseudojaborin, which is optically inactive; the nitrate of this base melted at 158° C. The other base they call pseudopilocarpin, which closely resembles pilocarpin, but is optically inactive. The nitrate melts at 142° C.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ANÆSIN.—A 1 per cent. aqueous solution of acetone chloroform, which is proposed as a local anæsthetic, being equally active to a 2½ per cent. solution of cocaine. Subcutaneous injection in minor surgical operations caused no side disturbances; also out of 60 cases of extraction of teeth 45 were entirely free from pain, the anæsthesia being complete.

FOR INCORPORATING COCAINE IN OINTMENTS, Lamanna (Boll. Chim. Farm.) recommends dissolving the alkaloid in an equal quantity of water and mixing first with a small amount of lanolin before incorporating with the fat or petrolatum. For example, in preparing 15 gm. of ointment, 1 gm. of cocaine, 5 gm. of lanolin and 10 gm. of petrolatum may be used.

A NEW PAVING MATERIAL is now being tried in Vienna. This consists of a mixture of granulated cork and asphalt, with other cohesive substances, which is moulded into blocks. It is claimed that it is to be very durable, elastic and cheap. The patentee (Lueders) also claims that when wet it prevents slipping. The blocks are dipped in coal tar before laying.

LARGE CRYSTALS.—Sci. Amer. finds in a recent number of Comp. rendus a method by which M. De Wateville obtains large and transparent crystals. The small crystal is so mounted that, while in a saturated solution, it can be continually rotated on itself with a speed of several rotations a second. Potassium and ammonium alums, copper sulphate and sodium chlorate are said to give particularly fine results.

TRIPHENYLALBUMIN.—An inodorous, tasteless powder, obtained by dissolving dry powdered egg albumin in 10 times its volume of phenol by heating several hours on a water bath, then on adding alcohol a white flocculent precipitate is obtained, which is afterwards washed with water. This compound is insoluble in hot water, alcohol and alkalies, but soluble in phenol. It forms a good culture medium for bacilli.

RUSSET POLISH.—Yellow wax 2 p. and stearin 1 p. are fused with 1 p. of linseed oil on a water bath and 6 p. of turpentine added with 1 p. of gold ochre. In another vessel 1 part of hard soap is heated with 10 p. of water till solution takes place; then both of these liquids are mixed, stirring constantly, until a uniform cream results; sufficient water is added to make the whole 30 p.; the mass is stirred till cold.

ANUSOL SUPPOSITORIES.—These suppositories have proven very effectual in treatment of hæmorrhoids, their composition being as follows:

Anusol (iodo-resorcin-sulfonate of bismuth)	7.5 gm.
Zinc oxide	6.0 gm.
Balsam Peru	1.5 gm.
Cacao Butter	19.0 gm.
Unguentum (Cerei)	2.5 gm.

M. ft. Sup. No. 12.

COLORATION OF GLASS.—"The experiments of M. Lemal on the coloration of glass by direct penetration of metals or metallic salts show," says Cosmos (Lit. Digest) "that glass in general, and particularly that into whose composition salt enters, is susceptible of being colored directly by the application of the salts of silver, the result being a clear yellow for ordinary glass, and an orange-yellow for glass of special composition. The coloration takes place at the temperature of 550° to 600° C. (958° to 1048° F.) and is independent of the salt of silver used, depending only on the length of time of exposure to the heat and on the quantity of coloring matter in the presence of the glass. The process, which is similar to that of cementation (in the manufacture of steel), can be extended to other metals."—Translated for the Literary Digest.

CREOSOMAGNESOL.—A mixture of creosote and magnesia is prepared by mixing 800 gm. of beechwood creosote with a solution of 20 gm. of potassium hydrate in 10 gm. of water; then in this mixture 170 gm. of calcined magnesia are incorporated. The resulting paste slowly assumes a dark color, and after 36 hours becomes of a pilular consistence. After a time the mass becomes hard and can be pulverized; this powder can be made into pills by means of honey.

THE PERCENTAGE OF SALINE MATTER IN SEA WATER.—Henry Leon estimated the quantity of saline matter contained in the water of the Atlantic ocean, which he found to be 32.657 parts in 1,000; in the Mediterranean sea he found 43.735 p. in 1,000; in the Black Sea, 17.663 p.; in the sea of Azov, 118.795, and in the Caspian sea, 62.942 p. in 1,000. The percentage of saline matter diminishes toward the poles, and increases toward the equator; also, as would be supposed, there is an increase according to the distance from land.

SODIUM TETRABORATE.—Chemically, under this title, the sodium salt of tetra or pyroboric acid is understood ($Na_2B_4O_7 + 10H_2O$); however, commercially, another compound has been introduced which has become quite popular in treatment of diseases of the eye and ear. This sodium tetraborate or borate of borax is prepared by dissolving equal weights of borax and boric acid in water, evaporating to dryness and pulverizing. The Phar. Ztg. proposed the employment of one molecule of borax and four molecules of boric acid.

PREPARATION OF SALICYLATES OF THE METALS.—Dr. Barthe (Ph. Post) directs that the dry acetate of the respective metal be triturated with an equal weight of salicylic acid, whereby a doughy mass results, with the separation of acetic acid, sufficient water is added to form a paste, the mixture is then heated on a water bath at 50° C. for a while, and finally dried at 70° C. The residue is a pure salicylate free from acetic acid. This same procedure may be followed in preparing benzoates, citrates, oxalates and tannates.

NAUSEA FROM CHLOROFORM ANESTHESIA.—When an operation under chloroform has been finished, pour vinegar upon the mask until it is well saturated, and leave the mask in place. As the vinegar evaporates, more should be added. This simple procedure has a marked effect in preventing or modifying the nausea after chloroform anesthesia. It was first advised by a French surgeon, who says that it acts by the vinegar forming a non-irritating combination with the chloroform vapor already changed in the lungs.—Virginia Medical Semi-Monthly.

PROF LEHMANN'S NEW METHOD FOR SUGAR ESTIMATIONS.—This is in reality a modified application of the well-known Fehling's test, in which a definite volume of the Fehling's solution of known copper content is mixed with a certain volume of the sugar solution; then the mixture is brought to a boil (with grape sugar 2, with maltose 3 to 4 minutes). The fluid is then poured into a graduated cylinder, rinsing with water until the volume reaches 250 cc. The solution is allowed to stand to permit the settling of the cuprous oxide; of the clear supernatant fluid a definite volume is drawn off (for example, 50cc.); diluted sulphuric acid, potassium iodide and starch are added, and the liberated iodine is estimated with N-10 sodium hyposulphite solution. The reaction is as follows:

$$2CuSO_4 + 4KI = 2CuI + I_2 + 2K_2SO_4.$$

The amount of copper present in the original solution being known, with that remaining unreduced according to the results of the titration, the difference would represent the reduced copper, from which the quantity of sugar present may be readily estimated.

KRYOFIN.—A methyl-glycolic-phenetidin ($CH_3.OCH_2.CONH.C_6H_4OC_2H_5$), melts at 98° C., forms white inodorous and tasteless crystals, soluble in 600 p. of cold and 52 p. of boiling water. Kryofin is obtained by interaction between p.-phenetidin and methyl glycolic acid according to the equation: $CH_3.OCH_2COOH + NH_2C_6H_4.OC_2H_5 = CH_3.OCH_2.CONH.C_6H_4.OC_2H_5 + H_2O$.

Being a derivative of phenacetine kryofin may be classed among the antipyretics and anti-neuralgics. Dose, 0.5 gm.

BENZO-IODO-HYDRIN.—This is a crystalline organic compound of aromatic odor, soluble in alcohol and ether. When warmed it gives off iodine; it contains iodine, chlorine and benzoic acid. Benzoiodohydrin is proposed as a substitute for potassium iodide, and for the purpose of administering, 32.5 gm. of the compound are dissolved in 65 per cent. ether and added to 1 kilo of sugar; the two are well mixed and dried at ordinary temperature. A teaspoonful of this granulation contains 0.13 gm. of the compound, which is equivalent to 0.05 gm. of metallic iodine, 0.05 gm. of benzoic acid and 0.014 gm. of chlorine, or is equivalent in effect to 1 gm. of potassium iodide.

SEPARATION OF MORPHINE FROM CODEINE.—Fouquet (Reper. de Pharmacie) proposes the separation of these two important alkaloids by means of their different solubilities in anisol, codeine being quite soluble in this solvent. The author mixed 1.044 gm. of codeine and 0.710 gm. of morphine; then he exhausted this mixture with 20 cc. of anisol (15° C.), afterwards filtering and washing with 10 cc. more of the solvent; the residue of morphine on the filter was dried and found to weigh 0.702 gm., a loss of only 1.026 per cent. This will enable the toxicologist to separate the two alkaloids with less difficulty than formerly.

WRITING ON GLASS.—The easiest way to write or paint on glass is to take a solution of fish-glue and distribute it with a soft brush over the surface of the glass. Of course the solution must be carefully filtered, and when it is applied to the glass pane the glass must be held over a stove or lamp in a slanting direction, to allow the surplus solution to flow off and to dry thoroughly without streaking. When the pane has been prepared in this way it is ready to write or paint upon. Even writing of microscopic minuteness can be applied to the prepared glass surface without the danger of the ink running. On this surface colors, India ink and any kind of pigment may be employed.—Crockery and Glass Journal.

ALCARNOSE.—An artificial food product introduced by Messrs. Riedel of Berlin, which represents all the nutritive value of a mixed diet in a very assimilable form. It is claimed that alcarnose is directly and entirely absorbed by the stomach; considering that a healthy individual consumes 660 gm. of food daily, which contains 17.4 per cent. of albuminoids, 7.6 per cent. of fat, 72 per cent. of carbohydrates, and 3 per cent. of saline substances, alcarnose contains in each 100 parts: (a) digested albuminoids, 23.8 per cent.; (b) extractives and saline matter of flesh, 2.3 per cent.; (c) digested carbohydrates (dextrin and maltose), 67.1 per cent., and (d) saline matter, 6.8 per cent. (sodium chloride, carbonates, sulfides, phosphates of the alkalies and alkali earths with traces of iron). Alcarnose forms a brown, tough mass, inodorous, of feeble, sweetish taste, resembling that of bread. It is soluble in water; in order to prevent any decomposition from exposure, alcarnose is put up in gelatine capsules of 12 gm. weight. From 10 to 15 capsules (120 to 180 gm. alcarnose) are sufficient daily for a patient, these being dissolved in hot water, with the addition of cacao and sugar or taken in boullion.

ESTIMATION OF THE PERCENTAGE OF ALCOHOL IN ETHER.—Lassar-Cohn proposes the following: A definite volume of ether is shaken with water; the aqueous fluid is then warmed to 60° C., in a current of hydrogen in order to entirely remove all traces of dissolved ether. The alcohol present in the water is oxidized to aldehyde by heating with manganese dioxide and sulphuric acid, during which time (10 minutes' boiling) the distillate of aldehyde which comes over is collected in 10 cc. of 1-700 normal solution of iodine. The distillate mixture is shaken with 10 cc. of normal potassium hydrate solution, resulting in the formation of iodoform; the filtered mixture is acidified with hydrochloric acid, and the quantity of free iodine estimated; from the amount of consumed iodine the percentage of alcohol may be calculated.

IMPROVED MEANS FOR COLORING PHOTOGRAPHS, SUITABLE ALSO FOR DYEING AND PRINTING.—J. A. Michel-Dansac and L. Chassagne, Paris. Eng. Pat. 18,131, Aug. 15, 1896. (Jour. Soc. Chem. Ind.)—The following five mixtures are claimed, and their applications to photographs on any support:

Albumin for Shadows.—Dissolve 200 grams of blood albumin in 500 grams of water at 37° to 40° C.; add to 500 grams of water, 1 gram each of the chlorides of platinum, sodium, palladium, ammonium, iron, chromium, cobalt, gold, tin, barium, nickel, strontium, cadmium, mercury, and silver. In a 125 cc. flask put 10 grams of cocaine hydrochloride; fill up with water. Let each mixture stand 24 hours. Add to the first solution, 5 grams of sodium sulphate, 1 gram of oxalic acid, and 0.25 gram of corrosive sublimate; take 100 grams of this mixture, whip up in it a fresh egg and a pinch of hæmoglobin, then mix with the remainder of the albumin, and add the cocaine solution. Finally, mix with the solution of chlorides, and let stand 24 hours.

Albumin for Reliefs.—Take half of the shadows albumin, add 1 gram of picric acid, 1 gram of chromic acid, 0.1 gram of formic acid, and incorporate with a mixture of 125 grams of water, 5 grams of sodium chloride, 1 gram of platinum chloride and 50 grams of fresh casein.

Blue Pigment.—To 100 cc. of the shadows albumin, add a solution of 1 gram of sodium chloride in 1 kilo of water; to 100 grams of this, add 5 grams of indigo carmine and 5 grams of oxalic acid, then mix with the remainder.

Green Pigment.—Add 50 cc. each of shadows and relief albumin to a solution of 1 gram of sodium chloride in 1 kilo of water. In 50 grams of the mixture dissolve 1 gram each of the chlorides of nickel, chromium, and copper, 1 gram of sulphate of copper, and 1 gram of copper nitrate. In a second 50 grams, dissolve 1 gram of picric acid and 1 gram of indigo carmine. Mix the two 50-gram solutions, and then add to the remainder, agitate and let stand.

Red Pigment.—Add 100 cc. of albumin for reliefs to a solution of 1 gram of sodium chloride in 1 kilo of water. To 50 cc. of this solution add 1 gram of each of the following: Cinnabar, iron chloride, iron sulphate, uranium acetate. Add this mixture to a solution of 5 grams of ammonium sulphocyanide in a second 50 cc., then add 30 grams of fresh casein, mix with the remainder and let stand.

The mixtures should be kept several months before use. The process consists in washing the photograph with the liquids in the following order: Shadows albumin, relief albumin, blue pigment, shadows albumin, green pigment diluted with 10 volumes of shadows albumin, reliefs albumin, red pigment diluted with reliefs albumin, shadows albumin; the albumin solutions being diluted for use with 10 volumes of 0.1 per cent sodium chloride solution. The photograph is not washed between the different applications.

QUESTION BOX

The object of this department is to furnish our subscribers with reliable and tried formulas and to discuss questions relating to practical pharmacy, prescription work, dispensing difficulties, etc. Requests for information are not acknowledged by mail and ANONYMOUS COMMUNICATIONS RECEIVE NO ATTENTION.

Carpet Soap.

(F. L. H.) Consult the Era, June 6, 1896, page 715, and Oct. 29, 1896, page 568.

Dispensing Whipped Cream Syrup.

(Mrs. V. P. S.), who says she has just put in a soda apparatus and is something of a novice, inquires how to dispense the whipped cream syrup, a formula for which was published in May 13 Era last.

This formula is from the Era Formulary. The preparation should be used the same as any other soda syrup. Put about three-quarters or one ounce to each glass, add the syrup, fill half full with carbonated water (coarse stream) and mix with the fine stream, otherwise not enough water can be gotten into the drink. A few trials will show the right proportion.

Electric Light for Small Pharmacy.

(H. L. S.) says that for a year past he has tried to get electric lights for his store, but his local companies would not bring the wires out so far. He wants to use two incandescent globes in his show window, and inquires how this may be brought about.

A practical electrician, to whom this query was shown, advises our correspondent to purchase a small generator, using a small gas or gasolene engine to drive it. Write to some electrical supply house for plans, cost, etc., of an outfit which will fulfill your requirements. As you are in California, you had better inquire in San Francisco.

Insolubility of Magnesium and Iron Sulphates.

(F. A. S.) asks what we think of the following prescription, and if there is any way to make a clear solution of it:

R

Magnesium sulphate	4 drams
Ferrous sulphate	15 grains
Acid hydrochloric, dilute	2 fl. drams
Alcohol, q. s., to	4 fl. ounces

You cannot make a clear solution of this combination. The difficulty lies in the insolubility of the sulphates in alcohol; both are nearly insoluble. You can only get around the difficulty by using water instead of alcohol, and you should ask the prescriber's permission on this point.

Concentrated Wild Cherry Phosphate or Wild Cherry Nectar.

(A. E.) desires a formula for a concentrated wild cherry phosphate which can be bottled up and sold the same as the advertised root beers, etc., so that the consumer can make the drink from the extract.

The principal difficulty in this scheme lies in the addition of the acid phosphate, which must be used in necessarily comparatively large quantities, and therefore cannot well be added to a concentrated essence. However, we suggest you experiment on the basis of one of the formulas in this journal, April 29, 1897, page 513, omitting the acid phosphate and the syrup, adding only the color, flavoring, etc. Find out how much will be required to flavor five gallons of finished product; this, when found, will be your concentrated essence. Direct this essence to be added to the syrup (about one gallon, the exact quantity to be determined by you), or sugar, and dilute with water to make five gallons. Then either charge with gas, or the liquid may be fermented with yeast, after the manner of root beer manufacture. After fermentation, add the acid phosphate. Considerable actual experiment will be necessary to determine just what is best.

Oil Balsam Cloves.

(F. A. S.) wants to know what the third ingredient is in the following liniment:

Oil spike	1 ounce
Oil origanum	1 ounce
Oil balsam cloves	1 ounce
Oil vitriol	2 ounces
Oil tar	1 ounce
Tanners' oil	1 pint
Spirits turpentine	1 pint

We can find nothing in literature, ancient, mediaeval or modern, that corresponds to this name. Oil of cloves is probably what is intended, and it may be used. Mix the oils, except the vitriol and tanners' oil, with the spirits of turpentine, then add the tanners' oil, and lastly the oil of vitriol, very carefully and gradually, stirring continuously in a capacious vessel, out of doors. This combination is a typical so-called "spavin cure."

Sulphur Hypochlor.

(R. B.) received the following, presented at his pharmacy:

R

Sulphur hypochlor. pulv	ʒ ij
Adipis benz	℥ ij
Ess. amygd. amar	gtt. x

M. ft. ungt.

On inquiry he found (from Merck & Co., where the prescription was put up first) that sulphur hypochloride pulv. cannot be prepared, but that it has to be impregnated in the lard in the nascent state.

This information is, in a general way, correct. The term sulphur hypochloride is one of the older synonyms for sulphur chloride. The article is prepared by passing chlorine gas over washed and dried flowers of sulphur until they are for the most part dissolved, and then distilling the decanted fluid from the excess of dissolved sulphur. One dram of this liquid to one ounce of lard has been used in lepra, psoriasis, and other chronic cutaneous diseases. In an article on explosive prescriptions in New Remedies, March, 1880, page 84 (reprinted from Chemist & Druggist Diary) it is stated that sulphur hypochloride is apt to explode if the bottle containing it be tapped, and if the stopper be fixed the tapping necessary to loosen it is nearly sure to cause an explosion. In a subjoined foot note the editors of New Remedies say that this name (Calcium hypochloride) is applied to a mixture of sulphur and iodide of sulphur.

Black Lead for Pencils.

(J. A. C.) wants a recipe for making black pencil leads such as are used in the ordinary pencils. He has tried without success the following formula: Ten parts by weight of plumbago, 7 parts German pipe clay, made into a stiff paste and run through a mould, and then bake in an oven (such as is used in baking emery wheels.)

The successful production of pencil leads is a very valuable trade secret to the manufacturers of pencils, and we cannot be confident of giving you any very satisfactory information on this subject. However, in a general way it may be said that black lead for pencils is usually prepared by one or another of the following methods:

(1). The blocks of plumbago are exposed to a bright red heat in a closely covered crucible, and are afterwards sawed into minute sticks and mounted in cases of cedar or satin wood.

(2). The plumbago, in powder, is calcined as before and then mixed with an equal or any other desired proportion of pure washed clay, also in powder, after which the mixture is reduced to a plastic state with water and pressed into grooves cut on the face of a smooth board or into well-greased wooden molds, in which state it is left to dry. When dry the pieces are tempered to any degree of hardness by exposing them, surrounded by sand or powdered charcoal, to various degrees of heat. The crucible is not opened until the whole has become cold, when the prepared "slips" are removed and mounted as before. This method was invented by M. Conte in 1795.

(3). The dough or paste prepared as last is reduced to the required form by forcing it through a perforated plate (in a similar manner to that adopted for colored crayons) or into minute metallic cylinders from which it may be readily shaken after it becomes partially dry. The leads for some varieties of drawing pencils are immersed for a minute in very hot melted wax or suet before mounting them. To the composition for others a little lampblack is added to increase and vary the degree of blackness.

Books on the History of Pharmacy.

(R. F. B.) wants us to suggest a sort of biographical, historical compilation giving plain facts about the profession of pharmacy, its origin, growth, some of its pioneers, or early champions, etc., etc. What is desired here is, in brief, a work bearing upon the history and development of pharmacy. Not all of this history can be found in one book, but the student must search through a large mass of literature. We can perhaps help him a little by a few words of advice, and giving the title of works which would be of assistance.

In the earlier ages pharmacy was so identified with the practice of medicine that to gain a clear conception of it in those days, one must needs study the development and literature of that science. The history of alchemy must also receive attention, and the story of the development of chemistry cannot be neglected. Indeed there is scarcely any limit to the field which you desire to enter. However, we think you will find the following works bearing directly upon this subject, the majority of which are likely to be found in your city library:

Renouard, "Histoire de la Médecine," 1846 (an English translation of this work is to be obtained); Ferriar, "Medical Histories and Reflections," Philadelphia, 1816; Handerson, "The School of Salernum" (Historical sketch of mediæval medicine), New York, 1878; Ruschenberger, "An Account of the Institution and Progress of the College of Physicians of Philadelphia During a Hundred Years from January, 1787," Philadelphia, 1887; Sprengel, "Historie de la médecine depuis son origine jusqu'au dix-neuvième siècle, traduite de l'allemande par A. J. L. Jourdan," 9 vol., Paris, 1820. (This work may be found in the library of the College of Pharmacy in this city.) Good, "History of Medicine, as far as it relates to the Profession of the Apothecary," 1795; Redwood, "Historical Sketch of the Progress of Pharmacy in Great Britain," London, 1880; Coree, "The Apothecary (ancient and modern) of the Society, London. Blackfriars," London, 1885; Frederking, "Gründzüge der Geschichte der Pharmacie und derjenigen Zweige der Naturgeschichte auf welchen sie basirt," Göttingen, 1874; Mallaina, "Historia critico-literaria de la Farmacia," Madrid, 1875; Peters, "Pictorial History of Ancient Pharmacy, with Sketches of early medical Practice." Translated from the German by William Netter, Chicago. (A new edition of this work has been recently published.) Besides these works you will do well to read the able articles on the "Growth of Pharmacy in the United States," "Ancient and Mediæval Precursors of Modern Pharmacopœias," and "History of Pharmacopœias," published in the Era during the early part of 1895. In the above outline no mention has been made of works on the history of chemistry.

The student will find a vast amount of historical information on drugs contained in Flückiger & Hanbury's "Pharmacographia," and the history of our own Pharmacopœia is presented in the historical introduction in that work. In your own city, Baltimore, you will find the library of Johns Hopkins University very serviceable.

Cutch Extraction.

When commercial cutch enters the domain of pharmacy it becomes catechu; but whether cutch or catechu, it is a substance of rather uncertain origin and of very variable composition. The following, from the Indian Pharmacologist, II., 7, January 1, 1897, indicates that there is still much to be learned about this substance. (Am. Jr. Pharm.): "One of the most recent issues of the Agricultural Ledger series contains a brief account of the examination of a sample of Burma cutch received by a Glasgow firm through Dr. Watt. It is interesting if only for the fact that it brings out strongly the divergence that sometimes exists between chemical analysis and commercial opinion. Dr. Watt suggested that cutch should be manufactured in India by the superior European method of extracting dyes from timber. Twenty tons of the Acacia Catechu timber were procured here and shipped to Glasgow. Dr. Watt saw the timber before it was shipped and considered it to be of average quality. The timber was treated by the vacuum process, and the resulting product was described by Dr. Watt as a cutch of great purity and very good appearance. A chemical analysis by Dr. Leather showed that the cutch thus produced contained 6.58 per cent. of crude catechin and 78.20 per cent. of catechu tannin. At the same time a sample was submitted to the Calcutta Chamber of Commerce for professional opinion, and this was completely opposed to the conclusion of the chemist. Commercial opinion described it as 'very inferior to that imported from Rangoon.' The sample was described as overboiled, and would fetch only Rs. 3 a maund as against Rs. 8 for the best brands of Burma cutch. Clearly the commercial expert who reported on the sample made a mistake in his identification of it, for he reported that it was shipped to the Calcutta market in 2-ounce tins for mixing with paints, 'and in this form it has a special value, but for medicinal purposes, or for bazaar use, that is, for mixing with *pan*, it has no sale.'

"Dr. Watt, in a brief note on this curious divergence of opinion, says that the only explanation is that trade opinions are based mainly upon external appearances. The sample is unlike the ordinary article met with in the market, and probably bears some resemblance to an inferior grade known to dealers. 'As a general rule, the commercial expert is lost if carried out of the field of comparative valuations. He knows little or nothing of chemistry.' That is true, of course, but the trade opinion shows that cutch prepared by the vacuum process, though pronounced by chemical examination to be of great purity and good appearance, will not, for the present at least, secure anything like a good price in the market."

"HELLO!

Oh! business is booming—lots of mail orders—begins to look as if we had a chance of winning that Era prize. Thanks for your order. Good Bye.'

THE PHARMACEUTICAL ERA

[*WEEKLY.*]

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NOW READY.

The Complete Prospectus, in pamphlet form, of the Era Course in Pharmacy is NOW READY, and will be sent to any applicant.

It is important that all students who desire to take this course should file their applications as soon as possible. In this way they will secure the benefit of the preliminary announcements and explanatory matter which will be published in the ERA during the remaining issues of this month and through August. They will thus be prepared to take full advantage of the regular lectures, which begin with the first issue in September.

All, especially those who have already filed their applications and joined the classes, who desire special information on any feature of the work are requested to send in their inquiries promptly, as we wish, as much as possible, to have these preliminary questions answered before beginning work on the regular lectures.

Matriculation Blank will be found in the Blue Insert, opposite page 112, in this issue.

Address, THE PHARMACEUTICAL ERA,
P. O. Box 1483, New York.

The Importance and Value of Sound Fundamental Education.

We have received a letter which suggests, not captious, ill-natured criticism, but a little kindly advice. In the first place the writer is a boy of fifteen, and the fact that at this early age he has chosen his life's calling and intends to get an education for it is worthy of both notice and earnest commendation. It is this kind of boy we want to help, the boy who knows what he wants and who proposes to get it.

What he wants is a pharmaceutical education, and we expect to see him pursue the Era Course in Pharmacy with both credit and profit to himself. He is a type of the class of boys and young men for whom the course is primarily intended, those who are so situated that they must pick up their education as best they may, who cannot attend a college, but must study at home, in the store, at odd moments during arduous shop labor, who perhaps are surrounded with all manner of annoying and disheartening conditions, who are poorly equipped with aids to education, such as books and other facilities, yet who, notwithstanding all disadvantages and discouragements, are firm in the determination to climb the tree of knowledge and shake down for themselves some of its most nourishing and palatable fruit. To these young men the Era Course offers the very best substitute for a regular college course that has ever been formulated, and which in its scope and character is well planned and well adapted to meet their needs satisfactorily. It fills the "long-felt want," providing an education of systematically arranged facts, logically presented in accordance with their importance and relation to one another, in place of the hit or miss style of training which results from the usual method of shop study. But our numerous announcements tell what the course is to be, and its value one can judge for himself.

These remarks lead up to the real subject of this little sermon, the text supplied by the letter, which shows certain deficiencies in the general intellectual training of the writer. This text is really the irrefutable proposition that in striving for an education it is primarily requisite that the foundation be laid substantially broad and deep. Without a good, general, preliminary education the acquisition of knowledge in any special profession becomes a matter of greatly increased difficulty. Educators in the field of pharmacy find this lack especially difficult to remedy. It is the main difficulty in the way of progress in pharmacy, for the knowledge constituting an education in this profession cannot be built upon no foundation. It requires as thorough a preparation as does any other liberal profession, science, or art.

So we say, other things being equal, the young man who has the best preliminary education, who can write and spell correctly, who has a working acquaintance with mathematics, can easier and better follow the Era Course than he whose fundamental knowledge is defective, who is careless or ignorant as to grammar, spelling, arithmetic and the like. These branches constitute the very framework of pharmaceutical education. Chemistry is largely a mathematical science, and in botany and materia medica the power of observation, trained by ordinary grammer school drill, is a prerequisite. The letter in question shows defects in several of these particulars, but in the very fact that it was written lie the hope and the confident expectation that these defects once pointed out, will eventually be remedied. This young man and others like him are not going to follow the course of study laid out just for the fun of the thing, but to know, and if they are shown that they must repair the foundation they will do it. We want to advise, to urge, them all to spend part of their time in the study of all these subjects in which they know themselves to be lacking. Be grammatical, write neatly, know the rules of punctuation and orthography, understand the real inwardness of mathematics and see how the rule of three, proportion, and percentage apply practically, then will you be ready and able to study profitably any course founded upon these essentials. A lack of early education can never be remedied in later life, it always hangs around the neck to hinder progress, and often becomes a reproach as well as a burden. Look out for this thing, boys. Don't be indifferent about it, but earnestly, systematically and thoroughly lay the solid and broad foundation of a general education in at the least the Three R's."

New Things to Learn.

Every business, no matter how simple it may seem, has a great many things about it for the apprentice or beginner to learn. The apprentice to the drug trade has before him a great deal of technical and scientific material which he must absorb and assimilate, and the energies of his employer are quite properly directed to this end. The business end is one that receives attention incidentally rather than systematically.

Buying stock, keeping books, displaying goods, treatment of customers, and general store management are inculcated through the force of example. The apprentice figuratively receives his business education by occasionally glancing over the shoulder of the proprietor and observing how he does things. This is so much the rule that there are exceptions to prove it. In many of these exceptional cases the instruction of the employé or apprentice is of the most thorough and beneficial character. The employer who has something to teach is usually the successful business man and is an enthusiast on the subject of doing business as it should be done.

But the curriculum of this most excellent school of business has been enlarged during the past few years. The education of the apprentice is not complete when he has gained a knowledge of store management, bookkeeping, care and purchase of stock, etc. He may be quite well posted and efficient on these points, but he may be weak on the main point. He may lack thorough proper training that valuable faculty which will enable him to induce people to trade with him after he starts a business for himself. He may have been well taught how to talk to people and cultivate their favor after they once enter the store, but he may be totally inexperienced in the methods which must be employed to induce them to put foot inside the street door. Many a beginner in business knows to a nicety just what to select for his stock, how to arrange his store, and how to treat prospective customers, but he does not know how to change the prospective to the actual customer. He has done and can do all the things that are necessary to be done inside a store, but does not know how to do the outside work. His first advertisement is a disappointment because it is an effort in a field in which he has had absolutely no experience.

The proper training of the apprentice of the future will include much of this important subject of advertising. His employer will not only impress upon him the value of knowing how to get people into the store, but will give him opportunity to try his 'prentice hand upon advertisement writing, not necessarily for publication, but for practice. He will encourage him to study advertising as he would a system for keeping books, and will always have around the store a good supply of that literature upon the subject which has almost made an art of advertising.

The Doctrine of Dilution.

We all know the story of the blacksmith who shod a horse for the compensation of one cent for the first nail, two for the second, four for the third, and so on, doubling each time, till, when sixteen nails had been driven the job netted him some $650. This story is called to mind when one is asked to consider the divisibility of matter as preached by our homeopathic brethren and theoretically and practically followed by them in their dilutions and triturations. We have seen it stated somewhere that if a single grain of substance were dissolved and diluted to 100 grains, this entire quantity then diluted by to one hundred times its quantity, this operation being repeated thirty times, the amount of water required would be greater than exists on the whole of this earth. We haven't taken the trouble to verify or disprove this statement by actual computation, but we have been interested in the remarks of a well-known homeopathic writer, who in discussing one phase of this subject, said recently:

> "It is not a mere matter of coincidence that, besides my own calculations, those of other writers have placed the limit of molecular divisibility of matter at about the 24th decimal or the 12th centesimal dilution. This same limit has been calculated by others independently of me, and now again the same figure is named by V. Naegeli. It is to be remarked, however, that both these and my own figures indicate that the actual molecular divisibility of matter is considerably greater than that found in the practical tests referred to. These and other researches go far to demonstrate that medicinal or toxic effects cease to be noticeable long before the actual divisibility is reached. So that even if medicines are divisible to the 24th decimal (requiring a mass of solvent equal to 7,017 cubic geographic miles) their useful effect ceases long before that, all the reported cures to the contrary notwithstanding. It would seem that practical men and physicians should give up their hyperbolical notions, and accept the actually stupendous solubility of matter, in place of an imaginary, mystical higher one, should check their overstrained enthusiasm, and study patiently and calmly the sources of knowledge bearing upon the subject."

We are glad to republish this. While willing to believe in the homeopathic doctrine to a moderate extent, we do not subscribe to the propositions of the advocates of high potencies, and believe, with the writer quoted, they "should check their overstrained enthusiasm." Verily the time-honored, historic method for making chicken soup by permitting for a moment only the shadow of a hen to fall upon a large pot of boiling water pales into insignificance in contrast with the claims of some of these theorists.

The Wood Alcohol Tariff Scare.

It seems that the solvents of the druggist are never safe while Congress is in session. One of them, wood alcohol, has just had a narrow escape at the hands of the Senate during the closing hours of the debate upon the Tariff Bill. An amendment was offered by Senator Lindsay of Kentucky placing an internal revenue tax upon it equal to that now levied upon grain alcohol, but this proposition was defeated. A few days later the project was again brought up, proposing, however, a tax equal to one-half that levied on grain alcohol, and this was in turn defeated, after a stream of six hundred or more telegrams protesting against the tax had poured into Washington.

It is surmised that the grain alcohol interests were behind this taxing proposition, and it is quite easy to see the effect which would have attended its success, were wood alcohol made as expensive as that made from grain. It is quite significant that this move should be made at a time when there is a disposition to further extend the use of wood alcohol in the arts. Although its use by the drug trade may not cut much of a figure when compared with its use in other industries, there is likely to be a considerable effort made to include it in the processes for many preparations now made with grain alcohol in the next issue of the U. S. P. The recommendation to this effect made by the committee on revision of U. S. P. of the Illinois State Pharmaceutical Association, published in last week's issue of the Era, is an instance of this movement.

It is noteworthy that among the most vigorous protests made against this proposed tax was that of the A. Ph. A. through its secretary of the committee on national legislation. There seems to be something of inconsistency in favoring a tax on grain alcohol which the druggist uses as his principal solvent and opposing a tax on an article which he can use only within certain limitations. But now that we are happily delivered from the peril of taxed wood alcohol what objection can there be to girding up our loins for an assault upon the unjust and burdensome tax upon grain alcohol?

The Patient and the Dispensary Question.

We have had something to say recently about the free dispensary abuse in the larger cities under which both druggists and doctors suffer. We have felt rather sorry for them, but now we learn with surprise and sorrow that sometimes the patient is the one who is victimized and to whom our sympathies should be extended. The medical journals report that a physician has been dismissed from one of the most fashionable dispensaries for abstracting a fifty-dollar bank note from the pocket book of a patient. The physician in his defense claimed he had been grossly overworked, had had time to eat but once during three days, and was tired and hungry. A leading medical paper says that hunger and the means at hand to appease it, may have proven too strong a combination for his overwrought nerves, but this naturally did not weigh with the board. The same journal proceeds (can it be in irony?) to say that "the clientele of the institution must be made to feel that while a patron is undergoing treatment his valuables are safe. The argument was used by one of the governors that, if the patients' money is to be taken from them, they might as well go to a physician's office and be done with it. The crime of robbing a dispensary patient cannot be too severely punished, since such acts would soon deter many persons of wealth from patronizing these institutions. It is therefore most fitting that the culprit in the present instance will be forced to take his chances for the future in private practice. There is something to be said upon the other side. It seems unwise for applicants to carry with them and display at the dispensary large sums of money, diamonds, and the like. It would surely seem to be in the nature of contributory negligence if in the future applicants for free treatment put temptation in the way of doctors, who after all are only human and often hungry."

But, seriously, does not this incident show up the real inwardness of the dispensary evil in X-ray manner? Why should charity treatment be given to patients who carry around fifty-dollar notes? If the doctor had whacked up with the druggists there might be more excuse for him. It would be but justice to these sufferers.

The X-Rayed Hen.

After thousands of years of deception and juggling with egg returns on the part of the innocent and solemn-looking hen, mankind has at last called science to its aid and the X-ray has been made to do duty in detecting the base imposition of the hen who ungratefully feeds at her master's expense three times per day and between meals and then refrains from producing eggs in payment. Heretofore this dereliction has been explained upon the grounds of gallinaceous original sin or general cussedness, characteristics frequently observed to be predominant in the neighbor's hens. Science is as yet dumb as to the great cause, but it furnishes a sure means for detecting the criminal. We have this on the authority of the Youth's Companion, which relates a story of a Californian who had a poultry farm with 10,000 hens. It requires a scientific mind to shoulder the responsibility of such an aggregation as will be readily admitted by one who has spent weary hours in chasing one hen off a flower garden, or in ministering to the wants of a dozen. This Californian by close observation and elaborate compilation of statistics came to the conclusion that one-fifth of his hens were not paying dividends. Knowing the power of the X-ray to divulge inside facts, its aid was enlisted and a preliminary examination of a dozen hens showed that eight were egg producers and four were non-producers. An X-ray plant was then permanently established and the 10,000 hens were put through a searching X-ray examination at the rate of 30 per hour. The result was a temporary season of overproduction in the dressed poultry market and a corresponding depression in corn meal circles.

Are Denver Druggists Liquor Sellers?

A Denver paper, in most approved realistic style, prints the alleged experiences of a "lady reporter" who was assigned to visit the drug stores of the city in a still hunt for violations of the law in the matter of dispensing spirituous beverages at the soda fountains. She tells her story in an artless way, under great "scare heads," and the presumption is that the drug fraternity is agitated to its greatest depths by her revelations. But a mean, envious rival paper is inclined to question her motives and her facts. It says thus in its breezy western diction:

"'The little innocent girl' the Times sent out to visit the drug stores last Sunday did a pretty good job in the way of hoisting in gin fizzes, whiskey cocktails and milk punches. If the 'little girl' tells the truth about the number of places she visited, the dear little creature must possess a 'tankage' on her fearful to contemplate. If her account of her experiences in the Times is true, she must have gotten away with about thirty-six great big elegant 'slugs,' and this fact rather knocks out the 'innocent little girl' theory. We have been a star in our time, but in our palmiest wild-oats days we could not have 'rastled' with a quarter of the stuff this little girl confesses to have tackled without having taken a genuine patent-leather jag with bristles all over it, accompanied by a full line of snakes, pink elephants and headaches. However, if drug stores are making a business of selling liquors through soda fountains, they ought to be made to take out a regular retail license just like any other dispenser of liquor."

We agree with the opinion expressed in the last-quoted sentence, but sincerely hope Denver druggists can sustain a plea of "not guilty."

Be Careful.

A couple of cases have recently been reported which emphasize the necessity for special care in the handling and storage of many articles in the drug store. Druggist J. W. Ritchie, of Kansas City, Mo., in attempting to open a gallon bottle of ammonia, struck the neck of the bottle on the show case to loosen the stopper. The liquid was warm (it being a very hot day) and the bottle exploded, the druggist getting the full force of it in his face. He was severely burned, eyes, mouth and lungs injured, and only by prompt action of the clerk was he saved from smothering to death. He may lose his sight.

The other instance was in a Warren (Pa.) drug store. Here the water had been allowed to evaporate from a can containing fifteen ounces of phosphorus, the stuff ignited and caused an exciting and damaging fire. The druggist was quite seriously burned in attempting to remove the phosphorus and put out the flames.

Such accidents as these are liable to happen in any store, but are most probable in stores where carelessness and forgetfulness are customary. It is a good plan to go through the stock regularly and systematically to see that all the elements of safety are present, and when handling easily inflammable or expansible articles observe every precaution of prudence and experience.

The Model Pharmacy Law.

Without going to the trouble to tabulate the returns, it is quite safe to say that at every meeting of State pharmaceutical associations this season there has been given voice to the conviction that the pharmacy laws of that particular State were inadequate, and to many of them the term "patchwork" was strongly applied. There were, of course, the usual resolutions to continue the agitation for better laws, and legislative committees were duly instructed to renew the annual struggle.

Before this onerous duty is seriously assumed, it would be well for all interested in the matter to take active part in the work which the Section on Education and Legislation of the A. Ph. A. has mapped out for consideration at the coming meeting at Lake Minnetonka. It is the intention to present, if possible, a draft of a model pharmacy law, and the committee representing the section is actively at work, through its secretary, in sending out an inquiry blank to obtain the views of pharmacists upon all the points which should be embodied in such a law. This circular is published in full on another page. The interrogatories cover the subject most thoroughly, embracing questions as to the territorial application of such a law, constitution of boards of pharmacy, grades of licentiates and their registration, definitions of titles, examinations, classification, handling and labeling of poisons, exemptions, etc., etc.

"In a multitude of counselors there is wisdom," and every pharmacist should embrace this opportunity to be one of the multitude that he may profit from the wisdom. A national law for the regulation of pharmacy may be out of the question, but State pride, or rather conceit, should not stand in the way of effort to make the laws of the various States as nearly uniform as possible.

Wisdom and good judgment are so evenly distributed throughout this country that the views of the pharmacist of Maine may be of value to his brother in California, and vice versa. There will be a most excellent opportunity for the exchange of these views through the machinery provided by the A. Ph. A., and the pharmacists of the individual States, when they present themselves before their respective legislatures, can certainly gain in prestige by presenting a measure which has been approved by a body representing the combined pharmaceutical intelligence of the entire country. This matter has long been agitated, and the desire has been almost universally expressed that somebody at some time would make the initial move. It has now been made, and all that is necessary is the united push of the profession behind it. Every pharmacist should lend a hand by procuring one of the question blanks and contributing his views for the guidance of the committee.

The Telephone Wins.

Some time ago the drug stores in Pittsburg, Kan., combined in boycott of the telephone monopoly in that city. For a period they held together and were firm, but the combine has now gone to smash because one drug concern, which was not in business at the time the boycott was arranged, has placed a telephone in its store. Of course the druggists couldn't stand this, so all of them have now put in 'phones, and the doctors will probably follow suit. So the hello girl will again reign, and the tinkle of the bell and the objurgations of subscribers be heard in the land.

Indiana does not possess a pharmacy law and a pharmacy board, and the condition of pharmacy in that State is not what should be and what is desired. But the doctors seem to be better off. Indiana has a State board of medical examination and registration which tries to do its full duty in the way of refusing registration to graduates from certain institutions which are not considered up to the proper standard. This board has black-listed a number of these off-grade medical colleges, among them the unsavory Wisconsin Electric Medical College of fake diploma repute. Though this year the druggists failed to secure the desired pharmacy legislation it is sincerely to be hoped they will soon get it, and be able to do what the doctors are doing, protecting the public and themselves against the incompetents and the frauds in their profession.

What a nice thing it would be if all pharmaceutical association secretaries would follow the example of their brother in Louisiana and get out the annual volumes of proceedings within reasonable time, before every one has forgotten all about the last meeting. The proceedings of the Louisiana meeting in May are at hand, just two months from the date of the gathering, and a nice volume it is. Keep it up, Secretary Legendre, and set the pace for the rest.

THE ESTIMATION OF MENTHOL IN OIL OF PEPPERMINT.—Dr. Clemens Kleber (Pharm. Rev.) says that a quick approximate estimation of menthol in peppermint oil can be made in the following way: About 5 grains of peppermint oil (accurately weighed) are mixed, in a flask connected with a glass-ground condenser tube, with about 5 cc. acetic anhydride, accurately measured* and boiled for 30 minutes. In the meantime an equal quantity of the same acetic anhydride is titrated with normal caustic soda and phenolphtalein. After cooling the boiled liquid somewhat, the condenser is taken off and washed with some water, which is added to the acetylized mixture, and then the latter is titrated with normal caustic soda. The difference in the number of ccs. in both titrations, multiplied by 0.156, gives the menthol in the oil used. An inconvenience of this method is that comparatively large quantities of normal solutions are required, and that the desired number has to be calculated from the difference of both, which naturally makes the method less exact, but all of the operations can easily be performed in 50 minutes.

PROFITS OF GERMAN CHEMICAL MANUFACTURERS.—The following annotation is from the Pharm. Jour. through Pharm. Rev.: The Farbenfabriken (Friedrich Bayer & Co.), of Elberfeld, made a profit last year of $1,334,000, and has just paid a dividend for the year of 18 per cent. The Badische Anilin-und Soda-Fabrik, of Ludwigshafen, on the Rhine, had a profit of $2,004,690, and has distributed 26 per cent.; and Messrs. Meister, Lucius & Bruening, of Hoechst a. M., came out with $1,707,775 to the good, and have been enabled to return 28 per cent. These several results were accomplished in spite of injury done by the Presidential election in America and by the famine and plague in India. No one can be surprised at the ever increasing business of these German firms who has made acquaintance with their murderous energy, etc. They employ large staffs of highly trained chemists who spend their time on novelties and the improvement of existing products. It is stated that Germany sent to the United States during the twelve months ending last June 9,763,000 pounds of alizarin, against 308,743 pounds sent by England, while of coal tar colors and dyes the imports from Germany were valued at $2,324,157, and those from Great Britain at $191,263.

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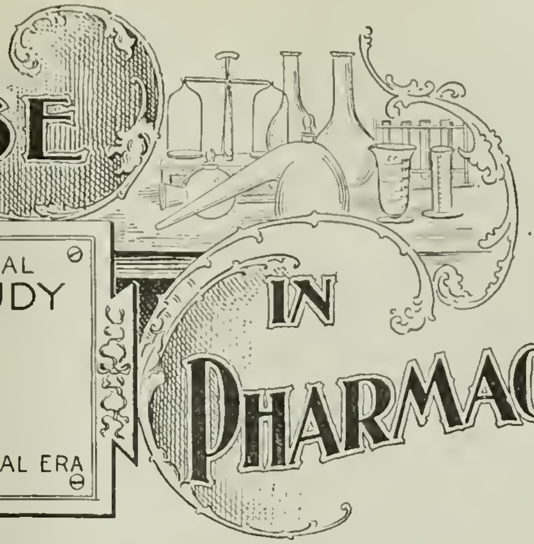
*For measuring exactly equal quantities of liquids is recommeuded the following way: Hold a common pipette, preferably one with a somewhat long narrow mouth, which has been filled exactly to the mark with the liquid to be measured, perpendicularly over the receiving flask and let it flow out. The liquid flows out in a stream which stops suddenly, it will then last a number of seconds until drops begin to fall off from the mouth. If the pipette is put aside as soon as the continuous stream stops and before the drops appear, the quantities of liquid thus obtained will be alike with great accuracy, but they are of course smaller than the quantity for which the pipette is gauged. In cases where only approximate, but in every case perfectly equal, quantities are desired, this method is of great value.

THE ERA COURSE IN PHARMACY



A PRACTICAL THOROUGH AND ECONOMICAL
COURSE OF HOME STUDY
IN PHARMACY
UNDER THE DIRECTION OF
J. H. BEAL, SC. D. PH. G.
AND
THE EDITORIAL STAFF OF THE PHARMACEUTICAL ERA

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THE "PRACTICAL STUDIES" OF THE ERA COURSE.

The attention of students of the Era Course is especially invited to the "Practical Studies" which will be given under most of the subjects, and to the importance of carrying them out in the manner prescribed.

It is common among inexperienced students to regard education as the mere memorizing of statements of facts from text books. This is a mistake. Text books are important, and statements of fact are important, but the student who relies exclusively upon such means of education will be disappointed at the result. Memory is but one of the instrumentalities of the mind, while education is the training and development of all the faculties. It must be a development of the ability to observe correctly, to reason accurately, and to properly apply general principles to special occasions. What is wanted is judgment, manipulative skill, the power to deal with emergencies, and to think and act for one's self.

An education composed merely of memorized formulas will be superficial, unsatisfactory, and evanescent. What is learned to-day will be forgotten by to-morrow. An education which has been a training of the faculties is real, fruitful and permanent.

Knowledge must come mainly through sense perceptions. The greater the number and variety of sense perceptions derived from one subject, the more complete will be the knowledge of that object. A perfect knowledge of things can only be acquired by a study of the things themselves, not merely by reading about them.

A surgeon cannot learn anatomy from printed plates alone, or the chemist learn chemistry from pictures of crystals and written descriptions of chemical reactions. Nor can one become skilled in pharmacy by the mere reading of books.

The text book is essential, but as a guide and preceptor. It tells the student where to find knowledge and how to obtain it.

The Practical Studies of the Era Course will consist of a series of easily performed experiments given under each one of the principal subjects. The manipulations will be such as any careful student may successfully attempt, with materials and apparatus everywhere at hand, or to be obtained at trifling expense.

In Botany, Pharmacognosy and Materia Medica there will be directions for the selection, preparation and examination of specimens illustrating points of structure, the identification of drugs, detection of spurious from genuine articles, and of valuable from worthless specimens.

Under Physics there will be experiments in demonstration of the properties of matter, the principal material laws, and their application to pharmaceutical processes.

In the study of Chemistry a large number of easily performed experiments will show the principal reactions of the elements and their application to the identification of chemical substances, and the detection of impurities.

By a faithful following out of these experiments the student may hope to gain real and lasting knowledge of the materials of pharmacy, to acquire habits of observation and deduction that will be valuable to him through life, and to become a better educated and more capable pharmacist than he could possibly become by devouring the contents of many books.

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We are receiving numerous inquiries of which the tenor is, "Can I take the Era Course in Pharmacy without being registered by the board of pharmacy?"

The purpose of this course is to afford an education in pharmacy, and is for the benefit of anybody and everybody who desires to follow it. It is particularly designed for those who have had little or no experience in the drug business, the apprentices and clerks, but it will be valuable alike to the experienced men, registered assistants, registered pharmacists, college students and college graduates.

The only condition is that the student be a subscriber to this paper in his own name, and that subscription and tuition fees be paid in advance.

It is for all, regardless of age, sex, color, or condition. The prospectus, free on application, gives full information.

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REQUIREMENTS FOR MATRICULATION.—The only requirements are that each student shall be a subscriber to the Era in his own name and his subscription paid in advance for one year; in addition to this there is a tuition fee of $4.00 per annum, payable in advance. This makes a total expense of only $7.00 for forty weeks of sytematic instruction, including quizzes and examinations by mail. The price is so low that our friends will please not ask us to make any exceptions to these requirements or terms.

FOREIGN RATES.—In reply to numerous inquiries we would state that the Era Course will be found particularly adapted to the wants of students in England and other foreign countries. The cost (increased because of the greater postage) to such students will be:

One year's subscription to Era	$4.00
Class fees (two terms) one year	6.00

Making a total of $10 per year for the full course.

N. Y. S. P. A. PAPERS.

Among the papers read at the Manhattan Beach meeting of the New York State Pharmaceutical Association last week, the following were among the more important:

THE PHARMACIST AND THE MICROSCOPE.

By HENRY KRAEMER, Ph. G., Ph. D., Philadelphia.

The topic of "The Microscope in Pharmacy" is by no means a new one. In this country, for at least the past twenty years, it has been a theme upon which comparatively many have written. Upon looking over some of these papers one is struck with the loyalty of the authors to the microscope, in describing its construction, uses and even possibilities. Nevertheless, one cannot but feel that the situation has been viewed in most cases from some other standpoint than the practice of the profession of pharmacy. The idea that seems to pervade the atmosphere is all that is necessary for the pharmacist is to procure the necessary apparatus (microscope, reagents, etc.), and books, and to follow the directions given. One furthermore receives the impression that because vegetable drugs possess characteristic structures, therefore the pharmacist ought to use his microscope in determining all of the drugs that he buys. The result of this kind of writing has to some extent hindered our progress in practical pharmacognosy in this country.

One Must Be Taught

to possess a microscope and not know how to use it, or to think one knows how to use it and spend one's time by one's self in endeavoring to interpret what is revealed there, is both money and time wasted. In order to obtain results that are reliable, in using a microscope for any purpose, one must know how to use the instrument and understand the structures in the department (say botany) where it is to be used. This knowledge can come only by being instructed properly. Of all the instruments devised in the prosecution of scientific research, there is none that requires that its user shall be better taught in the foundation and guiding principles of the science in which he engages, than that of the microscope. It is extremely unprofitable for any one to have the idea that he can teach himself the use of the miscroscope in the science in which he proposes to apply it. It looks very inviting to see a good illustration and to read of sectioning, mounting and examining a drug with the microscope. It is another thing to do the work and see the points. Experience teaches us that a beginner finds no help in the illustrations of books. What the beginner needs in doing microscopical work is not illustrations or facts, but ability to use his hands, eye and brain rightly. One must be taught, i. e., guided to knowledge. Time must first be consumed under a competent teacher in mastering the construction of the instrument and in becoming familiar with the methods of doing microscopical work and in learning the foundation and guiding principles of morphology (both outer and inner) of the plant kingdom. After this is accomplished the student will find books helpful. Now he can use his hands properly, see with his eye correctly, and interpret with his brain rationally. The more knowledge gained by personal observation the stronger and more self-reliant will the student become.

A broad botanical or even biological university training is the best foundation, and is necessary to accomplish the best work with the microscope. It cannot be said, however, that this is absolutely necessary in the prosecution of microscopical work by the pharmacist. It is necessary for him, however, to have mastered the foundation principles of physics, botany and chemistry in order to get the results that are of practical value to him. Some of our schools and colleges of pharmacy are now prepared to give their students a good start in this direction. The student must not be discouraged, but on the contrary expect "to make haste slowly" at first. He must exercise patience in learning to section drugs and work persistently under a competent instructor until he understand the principles of his subject. Nature does not unfold herself unless one works patiently and incessantly at her. When one problem is worked out, the next is easier. So that by the time the student is master of his subject results come comparatively easy.

Time and Place for Use of the Microscope.

Having shown that instruction is necessary in order to secure reliable results from the use of the microscope in pharmacy, the illusion that the microscope is necessary on all occasions must be dispelled. While it is an indispensable instrument sometimes, it does not follow that it must be used always, any more than because an axe is used to chop down a large tree therefore an axe is necessary to break up every piece of wood. The microscope has its time and place for use by every one who is accustomed to using it in his special line of work. It is as superfluous for the educated pharmacist to use his microscope in the examination of each lot of nux vomica or columba that he buys as it would be for the field botanist to require to make a microscopical examination before he could determine, say Castanea dentata or Quercus alba. In fact, it bespeaks lack of knowledge in the botanist. It likewise reflects on the professional pharmacist who wishes to make sections of those drugs which are so characteristic in a crude condition, and which by experience he ought to distinguish at once.

Applications of the Microscope in Pharmacy.

Upon completion of the proper laboratory course and being well grounded in the various sciences necessary for the use of the microscope in pharmacy, we must also recognize that in the use of the microscope there is a training of the eye (a sharpening of it so to speak) so that the trained eye with the other senses (educated too) are all to be employed where necessary in the discrimination of drugs. Now, there are times when the use of the microscope is essential—whereas at other times it is rather a convenience in the practice of pharmacy. Some of the applications of the microscope in pharmacy are the following:

(1) Examination of some crude drugs: While appearance, odor, taste, etc., are generally sufficient aids in determining most of the commercial drugs one from another, still there are instances when a microscopical examination is desirable and necessary. This is especially so when certain drugs occur in relatively small pieces or whenever drugs that possess similar characteristics are supposed to be intermixed or incorrectly labeled. The microscopic structure will generally enable one to quietly dispose of such doubtful cases. The following crude drugs of the U. S. P. require not infrequently a microscopical examination for their accurate determination. Especially is this necessary when they do not appear in the forms usually seen in commerce:

Mexican Sarsaparilla from Honduras Sarsaparilla.
Belladonnæ Radix (the horny kind) from Inula.
Belladonnæ Folia from Stramonii Folia.
*Serpentaria from Spigelia.
Granatum from Xanthoxylum.

There are a few cases in the examination of crude drugs when microscopical examinations have been advocated, and while sometimes necessary, the quality and nature of adulterant may frequently be told by the eye alone, as Crocus, etc.

(2). Examination of Powdered Drugs: In recent years powdered drugs have been introduced to such an extent that in many retail pharmacies few crude drugs are to be found. Drugs in the powdered condition may be obtained pure, but adulteration is more easily effected. The reason for this is owing to the inability of the average pharmacist in detecting it. We notice that some State boards in their examinations give the candidates few, if any, crude drugs for determination. In time there can be no doubt but that the candidates for the State board examinations will be required to determine powdered drugs and pronounce on their quality. This is desirable for the sake of the profession of pharmacy, and is in accord with the spirit of the State boards in giving the candidates as practical examinations as may be possible. The microscope must, in this province, be used; as only by means of it can one determine most of the powdered drugs and pronounce on the quality of all. By means of the microscope drugs of different origin may readily be determined, as the various sarsaparillas, sennas, ipecacs, etc.

(3). As a Preliminary Step in the Study of Plant Constituents: The microscope is of undoubted service as a preliminary step in conducting the chemical examination of drugs. The nature of inorganic substances may readily be detected. The nature of some carbon compounds, as starch, sugar and active principles (as oils, resins, tannins or other substances), may be detected qualitatively.

(4). In Determining the Relative Value of Drugs: It not infrequently happens that two drugs of different origin or habitat are used in medicine, and that the cheaper contains the larger percentage of active principles. A chemical assay may be resorted to, but when purchasing a small quantity of a drug this might not pay. By means of the microscope, however, an approximate comparison may be instituted. This applies not only to the powdered but also to crude drugs. The following instances may be cited:

(a). Gingers: The African ginger is cheaper than the Jamaica ginger, but the former contains more secretion cells, which are about the same size in both; hence the African, although the cheapest, assays a higher percentage of oleoresin.

(b). Buchus: The "short buchu" is cheaper than the "long buchu," but, nevertheless, the former contains much larger and more numerous secretion reservoirs than the latter; hence the "short buchu" assays more oil than the other.

(5). In Determining Loss of Active Principles: It is possible in some cases without resorting to a chemical assay to determine if the active principles have been removed. This is notably so in drugs that contain alkaloids, secretion reservoirs or secreting hairs, as in cinchona, ginger, cloves or any of the labiatæ.

(6). In Determining Identity and Quality of Spices and Foods: Since the introduction of spices in a powdered form into the household there has been the most flagrant kind of adulteration practiced. In many cases the microscope is the only satisfactory means for determining the purity of the drug or the nature of the adulterant. A few illustrations may be given:

(a). Pepper is admixed with mustard hulls, wheat flour, etc.

(b). Bermuda arrowroot is adulterated with and substituted by other arrowroots and starches.

(c). Tea contains leaves of salix alba, sambucus nigra, etc.

(7). In Determining Unknown Drugs: It often occurs that a pharmacist receives for identification samples of drugs that are unknown to him. It may be that they are common indeed and indigenous to this country. The microscopic examination at once gives him a start. The compound microscope is indeed playing a very important part throughout systematic botany. Certain groups or families or genera are found to possess a certain characteristic, and this is the key to the solution. It may be that the arrangement of the fibro-vascular bundle is peculiar, or that the shape of the element (root, stem, etc.) is characteristic, or the identification may be based on the nature of secretion cells or from the nature of hairs, etc. In the leaves the habitat may sometimes be determined by reason of the structure.

(8). In Biological and Sanitary Analysis: The advancing pharmacist is taking upon himself the study of those branches which are more or less directly related to medicine and for which there is evidently a growing demand. He is making the biological as well as the chemical analyses of water and reporting on the condition of the sputum, urine, etc., of the patients of the physician. In all this kind of work the microscope is necessary.

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*The microscope is not necessary here, as will be shown in an article to be published later.

(9). For Other Practical Purposes: Recently some one wished to examine the number of meshes in some sieves. The compound microscope was recommended for the purpose, the principle of the method followed being the same as that used in measuring the lengths of cells, etc.

The microscope may be used in detecting forging; in determining the writing on soiled labels; also in ascertaining the kind of writing paper, labels, etc., that are purchased, etc.

The Influence of the Use of the Microscope.

From what has preceded it is seen that the microscope has a very important bearing on the practical work of the pharmacist. It would not be proper in an essay of this kind to fail to record the influence of the microscope in the training of the pharmacist. The use of the microscope does for him as it does for all—an infinite amount of good that must not be overlooked. It makes better observers of all. The early workers with the microscope often remarked that it enabled the worker to see with the naked eye afterwards structures that were invisible to him before he used the instrument. By means of the simple lens one is enabled frequently to make out those characteristics of a drug that have been seen with the compound microscope. Finally with the naked eye alone, one can by experience obtain results in determining the quality of drugs that is based on structure and not on ephemeral external characters.

Results of the Use of the Microscope.

We must not be discouraged by reason of the skeptic and his oft repeated question, "What is the use?" The skeptic is as useful in treating this subject as he is in other problems. In the applied sciences this question is ever before the student. The pure scientist in his pure science will pay no attention to the query. But the business and professional man feels it necessary to devote his energies to those things only that will hand forth useful fruits. There is, however, an insurmountable difficulty in following the applied sciences. One cannot predict what scientific fact will be the basis or part of a principle in the construction of some useful invention. Hence we find it necessary to take in more than we can use practically and are silenced for the time sometimes by the question, "What is the use?" Nevertheless we are safe in recording some of the results that accrue to the educated pharmacist from his use of the microscope. The benefits are two-fold, viz., to the pharmacist and to the public.

I.—To the Pharmacist: The pharmacist is able to dispense drugs, foods and spices the purity of which he can guarantee. This means to him and for him:

(a). The most efficient of co-operative work with the physician.

(b). The building up of a good pharmacy the name of which shall endure.

(c). The establishment of confidence in him by the best physicians and the public. To have a good custom one must sell good drugs.

(d). The pharmacist receives the value of his money for his purchases. He does not pay a high price for an inferior drug, as a Honduras price for a Mexican or other sarsaparilla.

(e). The conscience of the pharmacist is clear, and he knows what he is selling.

(f). It is also an advertisement to the pharmacist, and he may judiciously utilize it in the building up of his estate here.

II.—To the Public: The public in return receive fine drugs, foods and spices. This means to them—

(a). Confidence in the pharmacist, which sometimes may prolong and even save life.

(b). Satisfaction in the goods for the money paid.

Arguments Against the Use of the Microscope.

(1). It requires an educated person to use the microscope to any advantage. A mere merchant could not use it with profit. It requires that one shall have spent time and money in acquiring a proper education. Hence they who have never been instructed by a competent teacher cannot practically avail themselves of the benefits of the use of the microscope.

(2). The cost of the outfit, being at least $25, makes some persons, who might use it profitably, think too long about purchasing a microscope.

(3). Time must be given to the use of the microscope. Many pharmacists feel that if there is any time to spare it ought to be given to "resting up" or waiting for the next rush of business.

(4). It takes "nerve" or backbone for one to go to college, to buy a microscope, to give the time necessary for securing results and to believe that all will pay in the end.

(5). The merchant who wishes to purchase his goods at the lowest price, regardless of quality, does not care to be able to know whether the guarantee for purity of the seller is correct. He would rather sell impure and adulterated goods with the clear conscience of wilful ignorance.

Conclusion.

A good education is necessary for a professional pharmacist, and he alone who is taught properly can use the microscope advantageously. The microscope may be utilized in so many practical ways by the educated pharmacist that the receipts far outweigh the cost and time. The light in the sky is already appearing, the clouds are rising higher and higher on the mountain side, and the practical pharmacists are ascending one by one to higher flights than where they rested yesterday, and they follow those who it sometimes may seem are working in the clouds yet who, nevertheless, when the light shines, are seen to be laboring for their benefit and the future of pharmacy.

THE DEPARTMENT STORE AND THE DRUGGIST.

By ALBERT H. BRUNDAGE, PH. G., M. D.,
Brooklyn.

As civilization has advanced, and human wants have become more diversified and exacting, so that inhabitants of large cities particularly have demanded that the whole world's products of cultivation and manufacture, and all its other sources of supply, shall be placed at their immediate and most convenient disposal, with the most advantageous display of variety, and at the lowest possible price—old business methods have to a certain extent been revolutionized and departures, both startling and extensive, been inaugurated.

Some ingenious mind conceived the idea of placing many classes of the world's products, in many varieties, in a location as central as possible, to a given community.

The outcome of this conception was that modern "Vanity Fair" known as the Department Store.

As such an institution's influence and its power to draw trade were more and more realized, there was a disposition to widen its scope and increase its profits by incorporating classes of goods, or lines of business, much less related to each other than those which had previously been associated. With this expansion of the centralizing tendency in trade and effort to secure all the advantages to be derived from an unexpected want created by an ingenious and attractive display of wares, great effort has been made to include even such lines of business as were limited to a specially trained and prescribed class of men.

Naturally the druggist was not overlooked, and his business has ultimately been more or less incorporated into the vast commercial mosaic whose prime and far-reaching principle was monopoly. The small tradesman and the skilled artisan were apparently to be as far as possible engulfed, and business interests controlled by a fortunate few. The public was gradually educated to look for much in return for a little; to be bargain-hunters. But experience proved not always bargain finders nor wise buyers. Where the department store has a drug department whose wares are offered at seductive prices, it, would seem that bargains in eye salves, bald head applications, kidney, liver and consumption cures, hive syrup, Rochelle salts or similar articles, must be a poor investment, when made upon the basis of probable need and to take advantage of attractive prices. Does it pay to buy what you do not want, particularly such things as these? The claim can hardly be made that these goods are dealt in by the department store for any higher purpose than to attract, or for simple profit. Consequently the question arises, can the department store afford for these purposes to provide a trained, skilled and licensed druggist and sell drugs altogether reliable, in conformity to pharmacy laws, and for prices much below the retail druggist's small profit? It would most decidedly seem not, and that the outcome must be a low salaried and incompetent salesman, or an adulteration and sophistication detrimental to all dealers' interests and hazardous to the public.

If the department store is to be the drug store, and to be in fact every other kind of a store, or to supply all the commodities, conveniences or necessities of life, it is high time the druggist took note of the fact and ordered his affairs accordingly. If the department store is ultimately to supply the community with drugs, cheese and wagons, cutlery and coal, meat and monuments, molasses and microscopes, carpets and coffins, horses and houses, a detective and a doctor, a blacksmith and a dentist, conduct a theatre and a crematory, druggists better all be candidates for the latter at once. It is not to be wondered at that the pharmacist should rebel against the losses he has suffered at the hands of the department store. His relation to the public, his high and responsible position as a conservator of public health, and the careful, arduous training he is compelled to undergo to fit him for his professional career, would naturally seem to make him exempt from such absorption.

His is a profession in which there are many irksome exactions and scarcely any compensatory returns. He has in the past been so preyed upon by grievous legislation, by the competition of illegitimate rivals, and a most unreasonable popular misapprehension as to his financial returns, that his lot has been in many respects quite an unenviable one.

He is too preoccupied with the very exacting duties and responsibilities of his calling to resort to defensive commercial methods. He is too conservative and self-respecting to resort to retaliative measures.

Because of the high character of his calling, the obligations placed upon him, and the unselfish devotion he so constantly manifests to the general interests of the community in which he is located, he should be so protected, encouraged and supported by proper legislation as to aid him in his high purposes, and to ensure him to the meager financial and other returns it may be possible for his vocation to afford him. And it is only by strict and considerate legislative enactment that he may hope to secure the recognition and protection which are his due.

To hasten that end it is incumbent upon every druggist to associate himself with his fellows, formulate his claims, and intelligently co-operate with adopted measures. Union will give him power. He will receive favorable recognition and secure satisfactory legislation and the enforcement of pharmacy laws. He will be relieved of some of his greatest misfortunes, and his many friends may then properly say, in the words of another—

"May his occupation never become a drug in the market as long as he sticks like his own plasters to business. May he never be bruised in the mortar of adversity by the pestle of misfortune, and may his rise in his profession be as accurately marked as his graduated measures. May his career be as unsullied as distilled water and as smooth and pleasant as pure Norbonne honey. May his success never be alloyed by a mixture of ill-luck or a tincture of regret. May his counter prove a crucible wherein he transmutes human ailments into precious metals and precipitates the golden deposit into his pocket.

"May he never be called upon to swallow the bitter pill of disappointment, or be macerated in the cruel spirit of enmity. Should fickle fortune ever refuse him her smiles, may he find an antidote in the soothing opiate of woman's love, be strengthened by the tonic of experience, and purified by the sudorific of patience. Thus, his best days being evaporated, the lamp of existence past trimming, when Dr. Death sends to his shop the dreadful prescription indorsed 'to be taken at bed-time,' may he be found carefully prepared, accurately dispensed, permanently entered in the day-book of memory, neatly put up in the white wrapper of purity, sealed with the melting tears of loving friends, or stamped with the trade mark of honesty, and duly labeled and directed for the better abode."

NEW METHOD FOR DETERMINATION OF CARBON MONOXIDE.—M. A. Mennet proposes the following: A solution of 2 to 3 gm. of silver nitrate in 1 liter of distilled water is prepared and marked A; in 1 liter of boiling distilled water, to which a few drops of pure nitric acid (free from HCl) have been added; a solution of potassium permanganate is allowed to slowly drop until a faint red coloration results. When cold, 1 gm. of crystallized potassium permanganate is added, with 50 cc. of pure nitric acid. This solution is marked B and kept away from light and dust. The reagent is prepared by mixing 20 cc. of solution A with 1 cc. of solution B and 1 cc. of pure nitric acid, adding pure distilled water (free from organic matter) to make 50 cc.

This reagent is decolorized by carbon monoxide or other noxious gases (as sulphuretted hydrogen); if it is desired to test for carbon monoxide alone then the air is drawn through a series of wash bottles which absorb the other reducing gases present. In testing, two glass stoppered flasks are taken; one filled with air which is to be tested, the other is filled with pure normal air; into each 25 cc. of the reagent is poured, securely stoppered and shaken, after which they are placed upon a sheet of white paper. The fluid in the flask containing the carbon monoxide will, after a time, have become colorless while the one containing normal air remains more or less unchanged red.

TOOTH WASH TABLETS.—Heliotropin 0.01 gm., saccharin 0.01 gm., salicylic acid 0.1 gm., menthol 1 gm., sugar of milk, 5 gm., spirit of rose sufficient; make into 100 tablets; these may be colored by dissolving in the spirit of rose eosine (red), chlorophyl (green), or indigo-carmine (blue).

DURING THIS CAMPAIGN the chief attraction is the Era Prize to the advertiser who gets the most replies to his advertisements during July and August. Vote early and often. Simply answer the advertisements which refer to the kind of goods you want.

AMERICAN PHARMACEUTICAL ASSOCIATION.

SECTION ON EDUCATION AND LEGISLATION.

At the last annual meeting of the American Pharmaceutical Association (Montreal, 1896), after the presentation and discussion of the statistic reports and various papers concerning legislation, the Committee of the Section on Education and Legislation was ordered to—

"Communicate with the various pharmacy boards, the legislative committees of pharmaceutical associations and pharmaceutical colleges of the United States and Canada, requesting them to co-operate in the drafting of a model pharmacy law, which form of law so drafted shall be submitted for the consideration and approval of the American Pharmaceutical Association at its next annual meeting."

The secretary of the section presented a comparative exhibit of the pharmacy laws of the United States, which affords excellent synoptical views of the provisions of all such laws now in effect (see Report American Pharmaceutical Association for 1896, pp. 319-345.)

In order to facilitate the work of reference, a series of interrogatories have been formulated, covering all the important provisions and essential details, symmetrically arranged in the order presented in the synopsis.

Answers to many of these must be more or less tentative, governed by local conditions and sometimes by statute limitations. It is believed, however, that a fair response to these interrogatories from the associations and others named will enable the committee to present to the American Pharmaceutical Association in August next a draft for a pharmacy law, which will more nearly respond to the present changed conditions of pharmacy in the various States, than the exceedingly variable and often unsatisfactory statutes under which pharmacy has been governed during the past decade.

Suggestions Relative to Answering the Interrogatories.

Do not answer the questions until the entire draft has been read and informally discussed as to the most important features.

Decide upon these first: Requirements for registration, poison laws, classification provisions, and the exemptions.

Write "No" or "Yes" in the space indicated after each query.

If in doubt or deemed inessential, leave blank.

Keep a copy of the result, and forward at once the answers to the Secretary, J. H. Beal, Scio, Ohio.

We believe it is the consensus of opinion that the pharmacy laws should operate—

To confine the compounding, sale or dispensing of drugs, chemicals and medicines to those alone who have proved their qualifications for such service—the registered pharmacists.

That in order to be a registered pharmacist a person should be thoroughly competent; have served some years in pharmacy, and be thoroughly grounded in the sciences that constitute the basis of pharmacal knowledge.

The laws of the present time come far short of fulfilling these reasonable and just requirements.

They are for the most part loaded down with all kinds of exemptions, leaving the pharmacist the empty honor of the title and the privilege of taxing himself to protect the public against incompetent dispensing, while the patent medicine man, the physician, the jobber, the general dealer, and every one else are the real medical purveyors to the public.

The boards are required to devote their time, energy and the funds contributed by the pharmacists to aid the ambition of every callow youth to assume the honorable and responsible vocation of opening a pharmacy, often for the exclusive benefit of some non-pharmacist.

It is believed that the time has come for a change in this respect. In connection with the interrogatories is presented a new departure: the classification of drugs, chemicals and medicines, and upon this the privileges and exemptions are based and clearly defined. The classification is not complete, the lists are are tentative, but they are sufficient to indicate the plan and scope of the proposed draft. The proposition, while a new departure, is simply an extension of the cardinal principle of all legislation governing the sale, etc., of drugs, etc., in English speaking governments—the poison restrictions. But the difficulty heretofore has been to define a "poison." Let us make an attempt to define what substances should be regarded as poisons. If the pharmacist be given the exclusive control of the poisons, and the privilege to define what shall constitute a poison, or medicine coming under the restriction of poison laws, other medicinal substances may well be left to themselves.

If you favor the project, have your association, board and schools or colleges interest themselves in this movement and aid this section all you possibly can.

C. S. N. HALLBERG, Chairman,
358 Dearbon St., Chicago, Ill.
JAMES H. BEAL,
Secretary, Scio, Ohio.
E. H. BARTLEY,
21 Lafayette Ave., Brooklyn, N. Y.
H. M. WHELPLEY,
2342 Albion Place, St. Louis, Mo.
GEORGE W. VOSS,
Cor. Woodland Ave. and Forest St., Cleveland, O.

INTERROGATORIES FOR THE BASIS FOR A DRAFT FOR A PHARMACY LAW.

Please Read Through Entire Before Commenting.

Territorial.

1. Do you favor a law uniform for the entire State with exemptions for domestic remedies?

2. Or, shall its application be limited to towns of a certain population (1,000)?

3. Or, shall its application be modified in its application to towns of graded population, say 500, 1,000, 5,000, 10,000, 50,000, and above?

4. Do you favor separate laws for populous cities or counties (as in New York)?

The Boards of Pharmacy.

Appointments:

How should the pharmacy boards be constituted?

5. By appointment simply of State officers?

If so, by what officer?

6. Appointment by Governor (or equivalent officer), upon nomination by State Pharmaceutical Association, with confirmation of Senate (or similar body?

7. Or according to the following or some similar plan?

Plan of Great Britain; Ontario, Canada; and Illinois, as in force in Illinois since 1889:

The Executive Committee, composed of one member for each Congressional district in the State (22), and three members at large (total 25), each appointed annually by the president of the Illinois Pharmaceutical Association, nominate one pharmacist from each Congressional district and three at large (25). These names are sent to every registered pharmacist in the State, along with the renewal certificate, the first of each year, with the request that the vote for five (5) names. The result of the vote is announced at the next annual meeting of the State Pharmaceutical Association, and of the five having received the greatest number of votes, the members in attendance may by vote select three, whose names are then presented to the Governor with the recommendation that he appoint one of these to fill the vacancy caused by the expiration of the term of office of one member of the board, December 31 following.

Membership:

8. What number of members do you favor for the board?

9. How many years of experience should a candidate for membership have?

10. Do you favor a lesser number of years' experience for some of the newer States?

11. Should the law require that the members, or a portion of them, be graduates in pharmacy?

Meetings:

12. Should the law prescribe the number of meetings per year of the board?

13. If so, how many?

14. Or, should it simply prescribe a minimum of meetings?

Salaries:

15. Should you favor a regular yearly salary? if so, how much?

THE PHARMACEUTICAL ERA

[*WEEKLY.*]

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NOW READY.

The Complete Prospectus, in pamphlet form, of the Era Course in Pharmacy is NOW READY, and will be sent to any applicant.

It is important that all students who desire to take this course should file their applications as soon as possible. In this way they will secure the benefit of the preliminary announcements and explanatory matter which will de published in the ERA through August. They will thus be prepared to take full advantage of the regular lectures, which begin with the first issue in September.

All, especially those who have already filed their applications and joined the classes, who desire special information on any feature of the work are requested to send in their inquiries promptly, as we wish, as much as possible, to have these preliminary questions answered before beginning work on the regular lectures.

Matriculation Blank will be found in the Blue Insert, opposite page 144, in this issue.

Address, THE PHARMACEUTICAL ERA,
P. O. Box 1483, New York.

The Dow Tax Phase of the Liquor Question.

The Dow tax is making trouble for some druggists, both retailers and wholesalers, in Ohio. This tax, some $350 or so, is placed on every druggist or other person who sells liquor for other than sacramental, medicinal, mechanical or pharmaceutical purposes. It is a great temptation to druggists who want to sell for beverage use to evade the tax, and there is claimed to be considerable violation of its provisions. Without payment of the tax liquors can be sold only on prescriptions, and here is where the honest, honorable druggist suffers. He must occasionally violate, not the spirit, but the letter of, the law, in emergency cases and the like; the sum total of all such sales is very, very far below the amount of tax, but he must suffer if he doesn't pay it. It is this class of druggists for whom sympathy is expressed, not only those in Ohio, but those of all States where similar tax impositions obtain.

In one Ohio village the authorities lodged complaints with the county treasurer that the Dow law was being violated and accordingly secret agents were sent out to investigate. They secured indisputable evidence of the sale of beer at two places, and accordingly demands were made for the payment of the Dow tax and penalty, amounting in each case to $420. When payment was refused the treasurer's agents proceeded to close up the stores and prepared to sell the stock and fixtures as the law directs.

This action brought the proprietors into court. One of the druggists several months ago took out a government license and opened a drug store. He placed a small stock of drugs in the front part of the room and at the rear had tables and chairs. He claims that all sales were made by prescription. The special agents claim that these prescriptions were continuous and the majority of them for large quantities, as high as six dozen bottles of beer being included in one prescription. The proprietor relies upon a favorable interpretation of the prescription clause of the Dow law. In the other case the facts are said to be about the same. Both proprietors have brought suits to enjoin the county treasurer from selling out the stock and fixtures.

All of which goes to show how a high tax unjustly imposes upon the honorable and places a strong temptation in the way of the unscrupulous, both results to be deplored.

But another phase of the question is of interest. Previous to this year the wholesale druggists have paid the Dow tax. Now, on the advice of counsel, they refuse to do so. The attorney general has authoritatively declared that if they keep within the law the tax need not be paid, but that if a wholesale druggist sold liquors to one hundred persons, and one out of that hundred sold the liquor as a beverage, the wholesale druggist would be compelled to pay the Dow tax.

So there you are. The wholesaler must know and be able to prove absolutely that all of his customers are of the right stamp, not one reprobate among them. It would seem almost necessary for their own protection that wholesalers require a bond from each patron, or something of that sort. The matter presents many interesting and perplexing aspects.

An Alcoholic Change of Heart.

We have observed with much satisfaction an apparent, though slight, change of heart in our esteemed contemporary, the Western Druggist, of Chicago, with reference to the Tax Free Alcohol question. In its last issue it says:

> "It is true that alcohol used in legitimate manufactures should be exempt from special taxation, but only on the condition that this could be done under regulations which would protect the revenue against fraud and guarantee the exemption to large and small manufacturers alike. This the treasury department has declared cannot be done, excepting, perhaps, through the device of methylation. * * * * * Nearly all the agitation thus far for tax exemption has come from a class of medicine manufacturers who demand, not a practical measure of relief for "an immense list of manufacturers," as in Germany, but a measure which will include their particular manufactures in the list—a thing which is done neither in Germany nor anywhere else, and a thing which cannot be done here until all alcohol is made free. * * * * * There is, however, much force in the contention of the grain-alcohol men that the present tax of $1.10 per proof gallon on their product is too high. There is no reason or justice in taxing any product to a point where the tax will defeat its avowed object, viz., the production of revenue. The present tax is a heavy burden on alcohol producers, *on all legitimate industries which are obliged to use it* (italics ours.—Ed. Era), and also on the revenue interests of the country. If it be said that no tax is too high so long as it contributes to the prohibition of the use of intoxicating liquors, the sufficient reply is that the regulation or prohibition of the liquor traffic is a function of the respective States, and not of the Federal Congress."

All this and some more is said in the course of some comments on the recent attempt to place a tax on methyl alcohol, which our contemporary opposes. Its backdown on tax free alcohol is not altogether complete, this is hardly to be expected from so bitter a former opponent, but it is evidently trying to come into the light with as little loss of dignity as possible. It cannot resist a repetition of the statement, so often proved untrue, that no one wants free alcohol except patent medicine manufacturers, but this assertion is not so strongly voiced as heretofore. We believe our friend is gradually coming to see the error of its ways, or at least recognizes the inconsistency of free wood alcohol and taxed grain alcohol. It cannot advocate the former on the ground that the druggist needs the cheap solvent without admitting the same with reference to grain alcohol; and when it asserts that the control of the beverage question must be left to the States severally for settlement it knocks away the last plank of argument from its platform of support. Grain alcohol is immeasurably superior in all respects and for all purposes to wood alcohol. Nearly all industries would use it if they could.

New York vs. Buffalo.

The Hon. Patrick Gleason, Mayor of Long Island City, and a self-constituted candidate for the mayoralty of Greater New York, recently paraded the streets of his odoriferous little bailiwick with a transparency reading—

New York for New Yorkers!

No Buffaloes Need Apply!

Some of the druggists from the State at large are said to have gotten the idea into their heads that a similar sentiment was to rule at the meeting of the State Association at Manhattan Beach two weeks ago. At any rate the "Buffaloes" were there in goodly numbers and they stampeded the convention resistlessly. It was a beautiful sight to see the enthusiasm which greeted President Smither's announcement that if a sufficiently large number of his fellow pharmacists wished him to serve again he would consent to take the office of president. This nomination was promptly seconded and made unanimous on the motion of the Kings County druggists who refused to put up any candidate in opposition. The election was as it ought to have been, harmonious and unanimous, and it ought to have convinced anybody of a doubting frame of mind that the suspected combination of local druggists to control the convention was purely a figment of somebody's imagination, but it didn't.

The matter of the offices being disposed of, Kings County had next to be arraigned as a culprit for attempting to consolidate all the boards of pharmacy in the State without authority from the State association, and without consulting the legislative committee of the association. This matter came up at a time when most of the members of the local board were absent, and some sharp words were indulged in which are not likely to be forgotten.

It was a glorious victory for Buffalo, but it may postpone the consolidation of the pharmacy boards for many years. It is scarcely probable that a law affecting Greater New York can be passed in the face of a solid opposition from Greater New York, but the temporary triumph of the Erie delegation has stirred up the Kings County druggists, and they will leave no stone unturned to get even. Their opportunity will come when Erie goes to Albany with its proposed new pharmacy law. New York and Brooklyn druggists will unite in defense of their respective colleges of pharmacy, both of which receive incomes under the Greater New York charter amendment which will then be in force. Erie's proposed law will cut off those incomes. Instead of taking advantage of the recent wrangle between New York and Brooklyn to gain the support of Brooklyn for one State board, Buffalo has healed their differences and united them in opposition to her own pet scheme. Thus the appearance of the State association when it petitions the State legislature for one board will be like that of the man who had bitten off his nose to spite his face.

Nevertheless the Buffalo druggists are right in favoring one law and one board, and in objecting to a tax upon all the retailers of a locality for the benefit of any private technical school.

Trade-Mark and Patent Protection to Foreign-Made Remedies.

Straws show the direction of the wind, and it is apparent that a very strong breeze is coming from the pharmaceutical fraternity if the number of straws is any criterion. This breeze of sentiment is with reference to the trade mark and patent protection afforded by our government to the many synthetic remedies of foreign, principally German, production. The drug trade has become very restive under the impositions it is suffering in this regard, and is beginning to speak its mind in no uncertain manner. Druggists have been punished, or threatened with punishment, for acts which are inherently, morally right, but legally wrong, made thus legally wrong by the ridiculous and preposterous rulings of the United States departments of patents and customs. No fault can, or is, logically found with the owners of the U. S. patents and the sales agents of these protected remedies, for it is their privilege to profit to the fullest extent from the rulings of the government, but fault is found with the condition which makes the abuse possible. Articles denied protection in the country of their production are given all they ask for here, to an extent way beyond the intent of the principles of patent and trade-mark law. We are allowed to import (paying duty thereon) all the stuff we wish, the government pockets the money, but we immediately become criminals if we use or dispose of it in any way whatsoever. The position is farcical and ridiculously inconsistent, but at the same time important and serious. Druggists, generally, are endeavoring to bring about a correction of this anomaly, by means of resolutions in their local and State associations which shall crystallize or combine into petitions to the Congress of lawmakers at Washington to correct the evil. The substance of all these resolutions and petitions is that Congress shall so amend the patent and copyright laws that foreign manufacturers may be accorded no greater advantages in this country than they are allowed in their own. The president of the New York State Pharmaceutical Association, at the annual meeting of this body a few days ago, urged the appointment of a committee to take steps to ascertain, upon reliable information, whether these articles can legally be imported, duty paid, and sold under their descriptive chemical names. If they can be so imported and sold at a greatly reduced cost to the consumer, and if in certain instances their chemical names are so unwieldly as to constitute an obstacle to their general use in prescribing, then let the N. Y. S. P. A. adopt short, euphonious, appropriate, but non-copyrighted names for such preparations, and officially appeal to the medical practitioners of the State to save their patients' money, by prescribing such preparations under the names so adopted, instead of the copyrighted ones. We believe this committee will find that this proposition cannot be carried out, but it is one of the straws, and a significant one, showing the direction and force of the zephyr. Similar straws come from nearly every State association, the American Pharmaceutical Association is devoting attention to this question as a crying one needing speedy solution, and, all in all, the weather indications registered on the trade barometer are prophetic of a healthy and inspiriting change. It cannot come too soon.

A Wilkesbarre, Pa., drug clerk is made defendant in a $15,000 damage suit, which, if all allegations are based on fact, presents rather more than the usual features of carelessness and incompetence. Trial of the case will show whether the clerk was at fault, but the claims are these: that he received a prescription for an affection of the eyes, and that he dispensed a wrong combination. The patient, or rather patients, for there were two, used the mixture, whereby one was made totally blind and the other lost the sight of one eye and the vision of the other became almost totally impaired. This is a very bald statement of the case, and we are inclined to think that the medical testimony upon trial will put a different complexion on the affair. Possibly, let us hope, the clerk will not be found in fault, though it is alleged that he discovered he had made a mistake and went to the patients' house and exchanged the right for the wrong, but not until after the latter had been used with the results stated. If this last allegation can be sustained, there is nothing for the clerk but to take his medicine with what resignation he can muster.

A citizen of a Maine city threatens to sue for damages a proprietary medicine concern, alleging that it is responsible for the death of his wife, who took a single dose of defendant's medicine and expired shortly after in extreme agony. The allegation is not unparalleled in the annals of patent medicines, but a little investigation discloses that the grounds on which it is based are somewhat unusual. It is not claimed that the medicine killed the woman, but that death was due to a considerable quantity of ground glass which happened to be in the bottle. Thus, it is a simple case of carelessness, and a simple suit for damages, not a thrilling accusation of poison, death-dealing patent medicine.

It is with mixed and disquieting emotions that we read a story from St. Louis relating that an inhabitant of that progressive city has invented X-ray spectacles. What is to become of us if this story is true. Must our apparel be metal-lined, must we—but, stop! let us not wander too far into the maze of speculation until we find out if the tale is true or apochryphal.

Correspondence.

We are pleased to publish here communications from our readers on topics of interest to the drug trade. Writers are requested to express their views as briefly as possible. Each article must be signed by its writer, but his name will not be publisbed if so requested.

Some Interesting Correspondence.

Louisville, Ky., June 1, 1897.

Mr. W. H. Newles, Secretary Missouri Pharmaceutical Association.

Dear Sir:—The proprietary section of the N. W. D. A., recognizing the unfortunate condition that exists in the retail drug business of the country (due largely to the forced evil of selling goods at cost) and at the same time recognizing the fact that this condition reacts in a measure against the interest of the manufacturer by causing in some instances druggists to unfairly substitute when popular staple remedies are called for, therefore our association, believing that a better understanding and co-operation should exist between the manufacturer and the retailer, appointed at their last meeting in Philadelphia a committee known as the committee on fraternal relations, whose duty and pleasure it will be to confer and co-operate with a like committee from your honorable body and kindred associations, as we believe by working together with one object and one end before us, many differences can be adjusted and great good can be accomplished. Sincerely trusting that your honorable body will give this question your earnest and favorable consideration, with best wishes for the success of your meeting, I am, fraternally yours,

GEORGE A. NEWMAN,
For the Committee.

Committee.

Samuel W. Bowne (Scott & Bowne), New York, N. Y.

G. W. Bower (J. C. Ayer Co.), Lowell, Mass.

R. V. Pierce, M. D. (World's Dispensary Medical Association), Buffalo.

Albert E. Richardson (Wells & Richardson Co.), Burlington, Vt.

Horace M. Sharp (Dr. D. Jayne & Son), Philadelphia, Pa.

C. A. Battle (Battle & Co., Chemists Corporation), St. Louis, Mo.

St. Louis, July 21, 1897.

Mr. George A. Newman, Louisville, Ky.

Dear Sir:—Your letter bearing date of June 1st, intended for the Missouri Pharmaceutical Association, was by mistake addressed to W. H. Newles, and did not reach Dr. H. M. Whelpley, the secretary, until some time after the meeting. I regret that it was not received in time to present to the association, as I think it would be quite interesting to have discussed the fraternal relations that exist, or should exist, between the proprietary section of the N. W. D. A. and the retail pharmacist.

It is generally believed that this section seeking fraternal relations with the retailers have been and are still spending money with the daily press to convert the dear patent nostrum consumer to the belief that the average pharmacist is indeed but little removed from the place occupied by common thieves, and indeed, in this letter that seeks fraternal relations, it comes from force of habit, the retailer must be reminded that he is dealing unfairly with this proprietary section, and is substituting.

There are none of the much advertised proprietaries that are not sold by all the large department stores in the country.

All the large scalping drug stores get more advantageous rates than the average pharmacist can secure. Why, sir, it has been only a few weeks since our city was canvassed with advertising matter in which the curative properties of one of the products of a prominent member of this proprietary section told the consuming public that their goods could be had at the drug store at 35 cents. The retailer pays $4 per dozen.

This is fraternity with a vengeance.

I believe that the average retail druggist has carried the olive branch just as far and as long as he wants to, and many of them are preparing a knife for their sleeve.

The present methods of this proprietary section will never succeed in restoring fraternal relations.

The Missouri Association will meet at Meremac Highlands on June 7, 8, 9 and 10, 1898, and we hope if you wish to offer anything fraternal you will kindly leave out any reference to unfair treatment accorded this beloved proprietary section, and quit talking about substitution until you offer us some means by which we can obtain more than 35 cents for a $4 article.

We never substitute, but we never sell anything for 35 cents that costs us 33 1-3 cents, when we can help it.

No one regrets more than myself the present condition of trade, and no one will be found more ready than myself to do honest battle for the much abused retail druggist.

It is now a question not of reaction against the proprietor, not of friendship, not of substitution, but of existence; and abusive words and invidious comparisons in the daily press, by this section of the N. W. D. A. will not tend to make matters better for the section.

Be assured of our entire willingness to fraternize with you only when you have abandoned your present methods of dealing with the retail pharmacist. Yours for peace,

THOMAS LAYTON, Pres't. M. P. A.

DELICACY OF VARIOUS REACTIONS FOR METALS. *

By DR. B. NEUMANN.

The following table, in its rearranged and improved form, is the result of the author's personal experience and comparison with well-known authorities:

Metal.	Reagent.	Sensitiveness.
Arsenic (as arseaous acid)	Hydrogen Sulphide	1:3,600,000
	Sodium Sulphite and Stannous Chloride	1:20,000
	Sodium Thiosulphate and Hydrochloric Acid	1:1400
	Lime Water	1:4000
	Cupric Sulphate	1:8640
	Argentric Nitrate	1:200,000
	Electrolysis	1:1500
	Electrolysis (with Fe and Cu)	1:133,000
	Marsh's Test (Mohr)	1:500,000
	Marsh's Test (Devergie, Otto)	1:100,000
	Bettendorf's Test	1:1,000,000
	Fleitmann's	1:5000
	Gutzeit's	1:1,000,000
	Reinsch's	1,250,000
	Fresenius-Babo	1:5000
	Zwenger's	1:50,000
Antimony	Zinc (Fresenius)	1:30,000
	Zinc (Rideal)	1:20,000
	Hydrogen Sulphide (Rideal)	1:41,000
	Hydrogen Sulphide (Neumann)	1:100,000
	Lime Water	1:1200
	Potassium Carbonate	1:2000
	Electrolysis	1:1,500,000
	Electrolysis (by Fe and Pt)	1:83,000
Bismuth	Potassium Iodide (Stone)	1:1,000,000
	Potassium Iodide (Field)	1:1,600,000
	Hydrogen Dioxide	1:190,000
	Tartaric Acid and Stannous Chloride in K O H Solution	1:210,000
	Potassium Cinchonylhydroiodide	1:1,000,000
Cadmium	Sodium Sulphide	1:250,000
	Potassium Ferrocyanide	1:10,000
	Sodium Hydrate	1:50,000
	Sodium Carbonate	1:20,000
Cobalt	Potassium Ferrocyanide	1:60,000
	Potassium Cyanide and Ammonic Sulphide	1:50,000
	Sodium Sulphocyanate	1:2000
	Potassium Xanthogenate	1:100,000
	Ammonia	1:1,000,000
	Sodium Hydrate	1:10,000
Copper	Potassium Ferrocyanide (Wagner)	1:200,000
	Potassium Ferrocyanide (Cooper)	1:4,000,000 1:11,750,000
	Potassium Ferrocyanide (Neumann)	1:250,000
	Ammonia (Wagner)	1:25,000
	Ammonia (Neumann)	1:50,000
	Ammonia (Will)	1:100,000
	Ammonia (Cooper)	1:1,000,000
	Potassium Xanthogenate (Wagner)	1:900,000
	Potassium Xanthogenate (Schwarz)	1:1,000,000
	Hydrogen Sulphide (Cooper)	1:15,660,000 1:4,150,000
	Hydrogen Sulphide (Neumann)	1:500,000
	Potassium Arsenite	1:10,000
	Sodium Sulphide	1:700,000
	Sodium Hydrate	1:30,000
	Potassium Carbonate	1:14,000
	Hydrobromic Acid (Neumann)	1:10,000
	Hydrobromic Acid (Sabatier)	1:10,000,000
	Hydrobromic Acid (Endemann and Prochazka)	1:100,000
	Sodium Sulphite and Pyrogallol	1:3,000,000
	Electrolysis (with Iron)	1:15,000
	Electrolysis (with Pt and Zn)	1:4000
	Electrolysis (with Pt and Br)	1:1,000,000
	Guaiac Tincture and Alkali Chloride	1:10,000
	Guaiac Tincture+HCN	1:500,000
	Guaiac Tincture Alcohol+HCN	1:10,000,000
Ferric Oxide	Potassium Ferrocyanide	1:500,000
	Potassium Sulphocyanate	1:1,600,000
	Ammonia	1:800,000
	Ammonia and Thioglycolic Acid	1:200,000
Ferric Oxide	Extract Logwood	1:15,000,000
	Tannic Acid	1:300,000
	Salicylic Acid (Smith)	1:32,000
	Salicylic Acid (Almén)	1:100,000
	Ammonium Sulphide	1:2000
	Sodium Sulphide	1:700,000
Ferrous Oxide	Potassium Ferrocyanide	1:440,000
	Ammonia	1:500,000
	Oxalic Acid	1:5000
	Sulphuric and Nitric Acids	1:300,000
	Tannic Acid	1:440,000
	Sodium Sulphide	1:700,000
Gold	HCl+Stannous Chloride	1:100,000,000
	Aqueous Hydrogen Phosphide	1:10,000
	Potassium Sulphocyauate	1:10,000
	Stannous Chloride (on Gold Bromide)	1:1,433,600
Iridium	Concentrated H_2SO_4+KOH	1:1,000,000
	Concentrated H_2SO_4+KOH, and Ammon Nitrate	1:1,000,000
Lead	Hydrogen Sulphide (Pappenheim)	1:100,000
	Potassium Bichromate	
	Hydrogen Sulphide (Cooper)	1:100,000,000 1:196,000,000
	Potassium Bichromate (Cooper)	1:4,000,000
	Potassium Bichromate (Harvey)	1:3,500,000
	Sulphuric Acid	1:40,000
	Sodium Sulphate	1:5000
	Potassium Carbonate	1:20,000
	Potassium Ferrocyanide	1:18,000
	Potassium Iodide (Jeanael)	1:40,000
	Potassium Iodide (Neumann)	1:10,000
	Electrolysis	1:50,000
	Cochineal Solution	1:400,000
	Electrolysis+Cl+HI or H_2 S	1:150,000
Magnesium	Ammonia	1:6000
	Ammonia and H_3PO_4	1:200,000
Manganese	Silver Nitrate and Caustic Soda Solution	1:200,000
	Potassium Ferrocyanide	1:25,000
	Ammonia	1:100,000
	Sodium Sulphide	1:500,000
Mercuric Oxide	Potassium Iodide	1:8000
	Hydrogen Sulphide (Schneider)	1:200,000
	Hydrogen Sulphide (Vigaoa)	1:240,000
	Stannous Chloride (Overbeck)	1:40,000
	Stannous Chloride (Schneider)	1:50,000
	Electrolysis	1:48,000
	Electrolysis and Cl+KI	1:100,000 1:150,000
	Tincture Guaiac	1:30,000
	Lime Water	1:4000
	Potassium Ferrocyanide	1:1500
	Alkaline Solutions	1:6000
Mercurous Oxide	Sodium Chloride	1:80,000
	Alkaline Solutions	1:80,000
	Potassium Carbonate	1:7000
Nickel	Potassium Xanthogenate	1:100,000
	Bromine+KOH	1:1,000,000
	Potassium Ferrocyanide	1:100,000
	Ammonia	1:10,000
	Sodium Sulphide	1:1,000,000
	Sodium Hydrate	1:10,000
Potassium	Sodium Nitrite, Cobalt Chloride and Acetic Acid	1:1000
	Platinic Chloride	1:205
	Tartaric Acid	1:220
Silver	Potassium Iodide	1:4000
	Potassium Chromate	1:10,000
	Potassium Arsenate	1:10,000
	Hydrogen Sulphide	1:35,000
	Sodium Chloride	1:24,000
	Potassium Xanthogenate	1:40,000
	Potassium Ferrocyanide	1:3300
	Electrolysis, Chlorine and Pyrogallol	1:200,000
Tin	Brucine	1:20,000
Zinc	Potassium Ferrocyanide (Mylius)	1:1,000,000
	Potassium Ferrocyanide (Jordis)	1:3,000,000
	Ammonia	1:6000
	Ammonium Carbonate	1:8000
	Ammonium Sulphide (Aarlandt)	1:2860
	Ammonium Sulphide (Cooper)	1:2,500,000
	Ammonium Sulphide (Jordis)	1:50,000
	Ammonium Sulphide (Neumann)	1:100,000

A NEW APPLICATION.—S. S. Teacher—I read in the papers of some naughty boys who cut off a cat's tail. Can you tell me why it's wrong to do such a thing? Willy—'Cause the Bible says, "What God has joined together let no man put asunder."—Brooklyn Life.

Friend—But if there's no hope of saving him, what are you going to perform the operation for? Doctor—One hundred dollars.—Brooklyn Life.

DROP THEM A LINE.

Era advertisers are working for a prize to be given to the one who receives the most replies to his advertisements in the Era during July and August. There is good fishing for retailers in Era ads.

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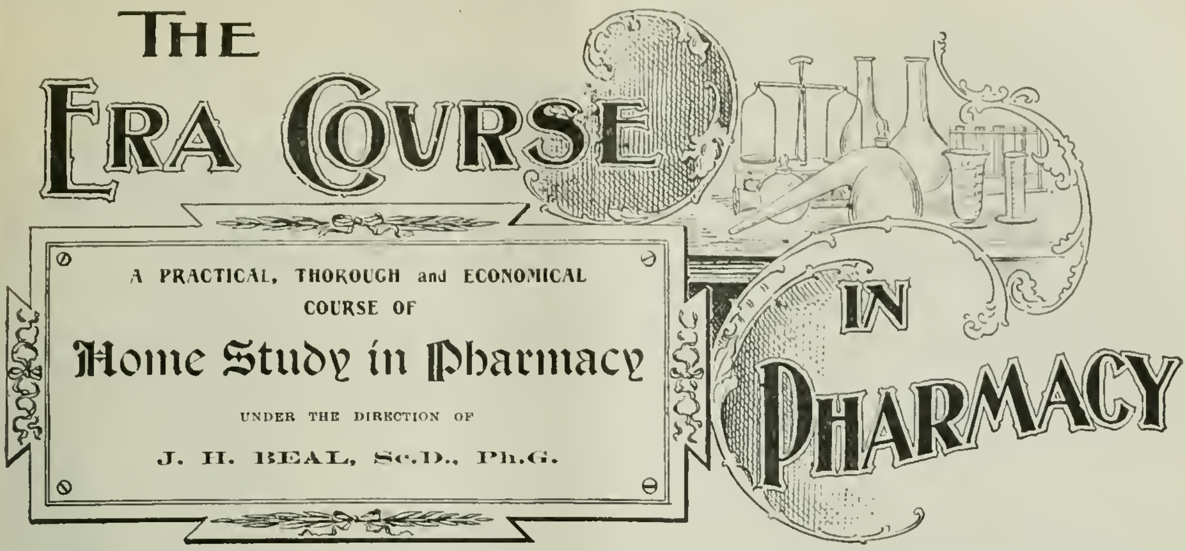
*Pharm. Ztg., XLII., p. 123. (Drug Topics.)



THE ERA COURSE IN PHARMACY

A PRACTICAL, THOROUGH and ECONOMICAL COURSE OF

Home Study in Pharmacy

UNDER THE DIRECTION OF

J. H. BEAL, Sc.D., Ph.G.

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THE STUDENT'S NOTE BOOK.

Great benefit may be derived from a well-kept note book, provided the student have a clear idea of its purpose and of the best way of using it.

First, there should be a separate book for each subject. To bring all matters together in one book will soon result in a disordered mess of stuff that will prove discouraging rather than helpful.

The actual form of book is not material. Preferably it should be small, from fifty to one hundred pages, about 5 x 8 inches in size, and opening at the end, like a common tablet. The paper should be good enough for use with a pen and ink, and well fastened to the cover. Loose pages in a note book are a nuisance. Unruled paper is to be preferred, as it gives greater freedom in paragraphing, and for the preparation of tables and diagrams.

Keeping the Note Book.

It should be kept neatly, methodically and regularly.

Every entry should be made with as great care as to penmanship, spelling, punctuation, and use of capitals as if it were a paper intended for the critical eye of an examining board. The faithful keeping of a notebook will do much to correct deficiencies in a common school education. Good penmanship, correct orthography, and skill in composition can be acquired only by practice, whether in school or out of it. The keeping of a note book offers opportunity for ample practice.

The discussion of every subject should be preceded by a carefully worded title indicating clearly the nature of the following paragraphs.

Some students prefer to first block out their thoughts upon a separate piece of paper, and after revision, to copy the corrected statements into permanent form. This is an excellent method, but the danger of it lies in the temptation to omit the final copying correction.

Purpose of the Note Book.

One purpose of a note book is to serve as a place for preserving information. This is an important feature where the student attends lectures. Really, however, it is one of the least important functions of the notebook. The note book has a far more valuable purpose than to serve as a repository for miscellaneous scraps of information. The benefit lies not so much in what the notebook contains when it is filled from cover to cover, as in the intellectual effort required to fill it. This is in reality the first and highest purpose of the notebook, though its importance as a repository of useful information is not to be disregarded.

How Era Students Should Use the Note Book.

The Era Course student should make use of the note book exercise as the means of assuring himself that he has acquired the thought of the lecture and made it a part of his own thought. After a careful study of the lecture upon any subject he should then attempt to transcribe the substance of it in short, concise, clear-cut statements to his own note book. The language should be his own, the thought should be his own, but the subject should be the one given in the lecture. The lazy student will ask, Why should I be at such pains to transcribe what I can always find in the text? Because the knowledge is wanted in the student's head, and the most effective means of getting it there is his attempt to formulate it in thought of his own and in carrying this thought in written language to paper. What practice in translation is to the language student this use of the written recitation is to students of every subject. The amount of mental drill which may be acquired simply from a careful study of the lecture is very meager as compared with that which will be obtained by reducing the thought gained to writing. The latter process implies digestion and assimilation, that the thought belongs to the student not as a trustee, but as owner in fee simple, that it has been translated into mental images of his own, and become a substantial part of his intellectual being.

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REQUIREMENTS FOR MATRICULATION.—The only requirements are that each student shall be a subscriber to the Era in his own name and his subscription paid in advance for one year; in addition to this there is a tuition fee of $4.00 per annum, payable in advance. This makes a total expense of only $7.00 for forty weeks of sytematic instruction, including quizzes and examinations by mail. The price is so low that our friends will please not ask us to make any exceptions to these requirements or terms.

FOREIGN RATES.—In reply to numerous inquiries we would state that the Era Course will be found particularly adapted to the wants of students in England and other foreign countries. The cost (increased because of the greater postage) to such students will be:

One year's subscription to Era	$4.00
Class fees (two terms) one year	6.00

Making a total of $10 per year for the full course.

THE EMPIRE STATE DRUG COMPANY.

Druggists who attended the recent convention of the New York State Pharmaceutical Association were surprised to see the very complete line of products exhibited by the Empire State Drug Company, in one of the rooms of the Manhattan Beach Hotel. The Empire State Drug Company is a protégé of the State Association, having been authorized over a year ago at the meeting in Buffalo. The plan originated in Buffalo, and had been indorsed by the Erie County Pharmaceutical Society before being presented to the association. As a result of the favorable action taken by the association, the company was organized and articles of incorporation were taken out on August 12, with the privilege of selling stock to the amount of not more than $50,000. The work of taking subscriptions went on rather slowly at first, except in the immediate neighborhood of Buffalo, where the laboratories were to be located. The manufacturing plant was not put into active operation until about Jan. 1, when a moderate line of goods was made, consisting of twelve or fifteen preparations.

That was only six months ago, and already the laboratories, which are located at the corner of Wells and Carroll streets, occupy three floors of the building, and give employment to twenty persons, besides a business manager and three traveling salesmen. Almost every pharmaceutical that goes to stock a drug store is here manufactured, including fluid extracts, elixirs, syrups, solutions, fruit juices for the soda fountain, medicinal wines, and a full line of proprietary articles.

Thomas Stoddart, of Buffalo, is at the head of the Empire State Drug Company, and others associated with him on the board of directors are Dr. W. G. Gregory, George Reimann, R. P. Hayes, R. K. Smither, J. A. Lockie, John Tilma, Jabez Peterson, Neil McEachren, and P. S. McArthur, all of Buffalo; C. A. Osmun, of New York; Thomas Dalton, of Syracuse, and Joseph Schnell, of Binghamton.

When asked how much business a year the laboratory was capable of turning out, Mr. Stoddart thought $200,000 not too high a figure. He said, however, that at present they were doing a business possibly of one-half that amount. Of course it is hard to estimate the annual production of a concern less than one year old, which started with only a dozen specialties, but the increase in business has been rapid and steady, and Mr. Stoddart did not hesitate to predict that if the druggists of the eastern part of the State should support the enterprise with the same loyalty shown by the druggists of the Western part of the State, in five years the company would be doing a business of $500,000 a year. He said that at present about 400 retail druggists had subscribed for various amounts, ranging from three to ten shares, at $10 each.

A few months ago permission was asked to take stockholders outside of the State, and also to dispose of stock to others than retail druggists, the idea being that capitalists might invest, but Mr. Stoddart says that none of the stock has been sold to any but those actively engaged in the retail drug business, and that no goods have been sold to non-stockholders. He promises that this will be the unvarying rule of the concern. Mr. Stoddart further says that at present the directors are giving every stockholder an extra discount of twenty per cent. on his purchases, till such discounts amount to the par value of his stock. This means that all who have subscribed up to this time are getting their stock free of cost. Mr. Stoddart will not say how long that arrangement will continue.

"The stock of this company ought to be an attractive investment," said Mr. Stoddart. "None of the directors or stockholders receives any compensation; it is therefore worked on a most economical basis, and solely for the benefit of the retail druggists. Besides saving a large amount of money to the stockholder, on the cost price of his goods (amounting in the case of one druggist to $2,500 a year), it is sure to pay handsome dividends on the investment, if it meets the success which the officers confidently anticipate."

LIQUID DENTIFRICE.—Dieterich recommends the following:

Powdered krameria	100 p.
Powdered cinnamon	50 p.
Distilled water	800 p.
Alcohol (90 per cent.)	200 p.
Salicylic acid	10 p.
Peppermint oil	10 drops
Clove oil	2 drops
Ylang ylang oil	1 drop

Macerate eight days, and filter.

EAU DENTIFRICE DE PIERRE.—

Star anise	15 p.
Alcohol	200 p.
Oil of star anise,	
Oil of peppermint, each	2.5 p.

Mrs. White.—Oh, you have a new pair of glasses. Mrs. Greene.—Yes; when I went into the optician's I didn't know quite what to say when the young man asked me if I'd have conclave or complex, but I finally took a pair of peristaltic. The name sounded so genteel, you know, that I made up my mind at once to take them.

PARISIAN AFFAIRS.

(Special Correspondence.)

Paris, July 16, 1897.

Professor Schutzenberger, the eminent chemist, died last week at the age of 67. An Alsatian Protestant, he took his degrees at Strasbourg, and was some time professor at the Superior School at Mulhouse. After filling various posts at Paris he was appointed (in 1876) professor of chemistry at the College of France; he was also director of the Municipal School of Chemistry and Physics. Elected to the Academy of Sciences in 1888, after the death of Debray (the chemist), his tall spare figure and comparatively youthful features were constantly to be seen at the Institute on Mondays. Four years previously he had become member of the Academy of Medicine. His works on "Chemistry as applied to Animal Physiology and Medical Diagnosis," his "Treatise on General Chemistry," and his chemistry "Lessons" are well known, he also published numerous notes and researches on fermentations, dyes, vegetable alkaloids and their derivatives, etc., etc.

Prof. Schutzenberger.

Dr. Thomas W. Evans, the American dentist of the Rue de la Paix, has just lost his wife. The doctor's name is historical in connection with the escape of the Empress Eugenie from Paris in 1870.

New Books.

Berthelot's "Thermo-Chemistry" is divided into two bulky volumes of 800 pages each. The first "Numerical Laws" contains two parts, devoted respectively to "General and Organic Chemistry." Volume II., entitled "Experimental Data," contains a first part on "Mineral Chemistry" (Book I, Metalloids; Book II, Metals), while the second part treats of Organic Chemistry in 12 chapters.

The author hints in his preface that this will probably be the last work he will present to the public. Not that the savant intends to forsake his scientific studies, but he feels that at three score and ten the last long rest cannot be far off.

Mr. Leconte, one of the few ex-pharmacists who sit in the Chamber of Deputies, has come out as a "spring poet." His little volume, "The Mysteries of Flora: or the Philosophy of Sciences," is in four cantos.

The Fire at the Bazaar.

Among those honored for services rendered at the Rue Jean Goujon disaster were M. Gourdel and M. Broca, pharmacists, and M. Moinet (M. Broca's assistant).

M. Gourdel has a pharmacy near the Parc Monceau, but happened to be at Rothschild's stables on business when the bazaar (just opposite) burst into a blaze, and the victims staggered, half dazed and half roasted, into the shelter of the stable yard. With improvised bandages and the vaseline kept for veterinary purposes, the pharmacist dressed the wounds of some of the most prominent victims, and did not leave till assistance arrived from the Beaujon Hospital—in fact, he telephoned to the hospital himself for help.

M. Broca, 13 rue de la Tremoille, lives in the Marbeuf quarter, so well known to American and English visitors. He was summoned in haste by Mme. Porgès, the rich banker's wife, whose new and splendid town mansion is just opposite the bazaar. An "ex-interne" of the Charity Hospital, M. Broca, is no novice at dressing wounds, "but not under similar conditions," said he. "It was the first time I was waited on by gorgeous flunkeys in a magnificent apartment, and told that if I wanted anything fetched from the pharmacy, a carriage and pair stood awaiting my orders; while the sheets torn up for bandages were the finest money could buy. My patients? They were in a bad state, some are dead, one lady lies yet between life and death. I booked the liniment and vaseline to Profit & Loss account—nothing much, you know."

Why these three gentlemen only received "honorable mention" while certain medical internes from the Beaujon Hospital (who came, so to speak, when all was finished) received medals, I leave to be explained by those who consider the medical profession ever to rank before pharmacy.

The X-Rays

still furnish unlimited "copy" to the Paris press. The latest idea is to utilize them for examining boxes in the Custom House. Experiments made recently at the Western Railway Station, Paris, seem to indicate their efficiency so far as small packages are concerned.

The desirability of a laboratory for skiagraphs at each hospital has been demonstrated by the case of a poor woman whose arm, broken by an omnibus, was not photographed and set for three whole days. At present the Salpetriere alone is equipped, but we are promised that apparatus shall be placed in the Trousseau and Bichat hospitals at an early date.

While speaking of photography I may note the unveiling of Daguerre's bust (in the presence of several of his descendants and relations) at Bry-sur-Marne last Sunday.

Pasteur's Disciples.

Dr. Yersin has left Bombay. Viennese savants cast doubts on the efficiency of his treatment for the plague. This has not prevented the Paris "Society for the Encouragement of Well-Doing" from awarding him a civic crown and many compliments.

Drs. Bordet and Danyez (Pasteur Institute) are in the Transvaal studying the rinderpest under President Kruger's patronage. Paris journals wish them better luck than Koch has had at the Cape.

On Jubilee Day

English pharmacists hung out flags, usually accompanied either by the stars and stripes or the tricolors, but they did not as a rule close all day like other trades. Mr. Douglas Hogg took an active part in the Jubilee Fund organization and was at the working peoples' banquet at St. Cloud on the 22d of June.

Rumex hymenosepalus

should be cultivated in Algeria on waste land on a large scale, says the Temps. Experiments seem to prove that the climate is suitable: Galveston (Texas) exported $50,000 worth in eight months.

J. J. Bouillot.

The all-round scientific education imposed upon the French Ph. G. may sometimes not be necessary, but "knowledge is power" all the world over: and I may perhaps be permitted to cite an interesting example of how a young fellow—unable to stand the physical fatigue of a pharmacy (which only those who have supported it really appreciate)—can make an honorable living by his varied course of study. Mr. Jean Joseph Bouillot entered the Paris School of Pharmacy in 1878, after the usual three years' "stage" in a drug store. But he had no intention of losing time, and at once presented himself for the examination in which the victors are placed as "internes" in the various Paris hospitals. Thus, during his three years' compulsory attendance at the school, his mornings were spent in gaining practical experience in dispensing at the Necker Hospital. That he kept abreast of his less occupied comrades is proved by the gold medal for chemical analyses awarded him by the school, as well as the "first" in Natural Sciences which he gained at the Sorbonne. After taking his degrees at the School of Pharmacy, M. Bouillot was attached to M. Milne-Edward's laboratory as preparator of physiology and comparative anatomy. He profited by his opportunities to make original researches on the kidneys of batrachian reptiles, and his paper on the subject was read before the Academy of Sciences.

J. J. Bouillot.

After serving a year in the army (as the law exacts), he left the colors with the rank of "adjutant pharmacist of reserve," and joining the Tunisian Hydrographic Expedition of 1883, he sent in an interesting report to the Society of Pharmacy on the surroundings and dredgings of the Bay of Gabès, and was awarded a medal by that body and the order of the "Nicham" by the Tunisian Government. He went into business in 1889 in the Boulevard Majenta, but failing health compelled him to sell out in 1892. While carrying on his favorite studies of biological analysis, he occupies a position as consulting chemist at Deffin's antiseptic dressing manufactory, and is business manager of the "Pangaduine" Company. This product contains the alkaloids and active principles of cod liver oil—those who have followed the proceedings of the Academy of Sciences may remember that some four years ago M. Bouillot presented a paper on the diuretic and urepoietic effects of the alkaloids in question. And (filling up his spare time as usual) he is now studying for the M. D. degree.

A tempest in a teacup has been worrying the pharmacists and politicians of Atlanta and the rest of Georgia. Some time ago the legislature appropriated $1,000 to the State Board of Pharmacy for the purpose of analyzing and preventing the sale of adulterated drugs. The board appointed an inspector to travel through the State to collect samples, etc., but before he was ready to start the howl arose that it was illegal to use the appropriation in this way, to pay the inspector's expenses, etc., but that it must be entirely used for expenses of analyses. Then the friends of the inspector, who was at one time a member of the board of pharmacy, accused a present member of trying to put a spoke in said inspector's wheel, and politics and personal feelings of the two individuals and their respective adherents quickly stirred up a very pretty row, which was nuts for the papers, furnishing material for numerous scarehead articles. But everything is serene again. Present board member proved he was really the cause of the appointment of ex-board member as inspector and that the two are old friends, the attorney general has decided that the board can spend the money as it sees fit, and the inspector will soon start on his travels. All's well that ends well.

"There is no doubt that students in pharmacy derive great benefit from any course of study, if pursued systematically and with regularity, especially if coupled with practical experience."—P. L. Viallon, Bayou Goula, La.

N. Y. S. P. A. PAPERS.

At the Manhattan Beach meeting, July 13-16, of the New York State Pharmaceutical Association, two papers were presented upon the subject,

ADVANTAGES AND DISADVANTAGES OF RENEWAL OF REGISTRATION.

I.

> To re-register, or not to re-register, that is the question:—"Shall we rather bear those ills we have than to fly to others that we know not of?"

This modern problem in ancient dress revolves periodically in the minds of our official Hamlets.

Some five or six years ago the Board of Pharmacy for the County of Erie secured an amendment to its law, providing for the annual re-registration of all licentiates in pharmacy practicing their profession within the City of Buffalo. During this period the writer has had an opportunity of officially observing the operation of this requirement, and it is believed that a study of the plan in actual operation will be more profitable than a purely theoretical consideration.

Our law designates the first twenty days in May as the period for re-registration, and empowers the board to fix the re-registration fee at amounts not to exceed two dollars for a pharmacist, and one dollar for an assistant pharmacist. These maximum rates have never been fixed by the board, as it has been found that just one-half of them is sufficient to yield the necessary revenue for the maintenance of the board.

In order to make the requirement as easy of observance as possible, it has been the custom of our board to place the re-registration blanks in some centrally located pharmacy, so that re-registration can be conveniently performed in person, as well as by mail. A list of the drug stores in Buffalo is prepared in an indexed volume, and after each period of re-registration, all pharmacists and assistants complying with the law are credited to the various stores in the city.

After this is done, a very few minutes will furnish the board with the knowledge of what stores are properly equipped with licentiates and what stores are not thus supplied, and are consequently violating the pharmacy act. With this knowledge it is a comparatively simple matter to enforce the law, because the board is able to direct its attention to the exact places where investigation is needed. The law does not provide for notifying licentiates of the re-registration period, but as a matter of policy the board annually notifies all the pharmacies of the requirement, stating at the same time the fee and the location of the re-registration blanks.

No opposition to this portion of our law has ever been shown, unless there may have been one or two sporadic cases, which are euphoniously known as cranks.

As is suggested by this description of re-registration in Erie County, it can be seen that the two chief advantages pertaining to the plan are, first, the information which is secured by the board with reference to the licentiates in pharmacy in the stores within its jurisdiction, enabling the board to concentrate its attention to the execution of the law where it is most needed, and the second advantage of securing an income, without which the operations of the board could scarcely be carried on.

But now I hear the familiar objection that what will work in little Buffalo, is not practicable in a larger and more populous district, and I am quite prepared to concede that the methods of carrying on re-registration might have to be varied to suit changed conditions, but that it is impossible in Greater New York, or even in the entire State, is not to be admitted for one moment.

It is not to be claimed that an index list of all the drug stores in the State of New York is a practicable arrangement, and I am very free to confess that I have not studied the larger problem enough to recommend in detail the best methods of carrying out re-registration throughout the State.

It occurs to me, however, that very possibly the law of averages could be made to apply in this matter as in so many others. It is a matter of common knowledge that there is a fairly regular ratio between drug stores and population, and so while a record might not be made of every pharmacy in the State it might be expected that a certain proportion of drug stores would be found in all sections of the State, making due allowance for the character of the districts and the nature of their population.

Suppose the average ratio of one drug store to about 2,000 of population were chosen, when the period of re-registration was passed, by having the licentiates indexed by cities or counties or in some similar way, it would be comparatively easy to select districts for investigation.

Another would be to publish a list of all who re-register, and then to solicit their co-operation in securing the re-registration of others.

The claim cannot be maintained that this will throw an undue amount of labor upon the Board of Pharmacy, for the work of issuing notices, filling out and mailing certificates of re-registration and indexing those who re-register is of such simple character that it could easily be done by inexpensive clerks.

It appears to the writer that the only possible disadvantages which can reasonably be alleged are, first, the trifling inconvenience connected with re-registration to those re-registering, and secondly, the slight expense to those subject to the law. These disadvantages are so far outweighed by the advantages of re-registration that even if the State should support the Board by a sufficient appropriation for all its needs the writer would still be in favor of a re-registration requirement.

WILLIS G. GREGORY.

II.

Buffalo, N. Y.

In my opinion everything can be said in favor, and little, if anything, against re-registration. Where local boards exist, there is perhaps less need for it than where one board has jurisdiction over a whole State, as there is little excuse for a local board's not keeping track of each and every store, but with a State board, with members scattered at different points, meetings occurring quarterly, or even monthly, it cannot be expected that all the changes in stores will be known, and in some remote points parties not entitled to practice pharmacy might be owners of, or in charge of, pharmacies for five or ten years, without the proper officials being cognizant of the fact. With re-registration (and this should be annual) such work would be stopped (if the law is properly constructed) and all those who at a certain date have not complied with the law should be proceeded against and forced to come up for registration, by the strong arm of the law.

The only thing to be said on the other side is the hardships imposed on the druggists by the renewal, these being the time necessary to appear and the expense; the latter in our opinion should be only a nominal sum, just sufficient to cover the actual expense; the penalty for non-compliance enough to make prompt attention sure. No other course has been proposed which so easily ensures the board's knowing just what is going on at all times. By all means let us have re-registration.

EDW. A. SAYRE.

INTERCHANGE OF CERTIFICATES.

By WILLIS G. GREGORY, Buffalo.

Should a pharmacist, licensed by an accredited Board of Pharmacy, be thereby eligible to practice pharmacy in all the States.

The enactment of pharmacy laws marks the appreciation both on the part of the public and of pharmacists themselves of the necessity for the better protection of the public in the matter of dispensing medicines and poisons.

The character of legislation controlling the practice of pharmacy shows clearly that such increased protection was intended to be secured by a better preparation or special education of those who were to do the dispensing of the future.

The law covering the practice of pharmacy in Erie County was passed in 1884, and the conditions there were probably very similar to those in every other district when a Board of Pharmacy was first given jurisdiction. We found the stores largely manned by those who had grown up in the business. The preparation of many of those who were then dispensing was along most narrow lines; they were largely store trained; had little knowledge of books or principles; frequently could not write grammatically, and even made ludicrous blunders such as dispensing the powder from a can in which bromine was packed in place of bromine itself.

After the organization of the Erie County Board the examination requirement speedily operated in bringing a better equipped class of men into pharmacy. The change was so rapid and marked that it was frequently commented upon in our city. It is not at all probable that these conditions and experiences were peculiar to Erie County, but it is highly reasonable to believe that the same changes have taken place and will take place where examining Boards of Pharmacy have been established. If this be so, and the writer firmly believes that it is, then at the present time in this country our States are in the various stages of this process. We have States with no laws; some with new laws and some with a fully developed condition of supervision by Boards of Pharmacy.

To refer again to our experience in Erie County; our examination standard has varied with the age of the Board, beginning with a very moderate standard in order not to make the change too radical, and so alienate that support of the local pharmacists which the Board needed to maintain its existence. This standard has been gradually raised, until now we cherish the belief that it is as high as any, if not the highest, in this State. We have no idea that we are very different from other Boards, and believe that our experience is somewhat common to all Boards of Pharmacy.

Now, with these two conditions in mind, first, the various stages of progress in the administration of pharmacy laws, and the somewhat similar stages of development in the examination standards of the different Boards, it will readily be seen that there can be nothing like uniformity of conditions in the different States in this country for many years to come, and, therefore, acceptance by the various Boards of each other's licenses without any restriction, would be an unwise and unfair practice.

It is desirable that interstate recognition of licenses shall be encouraged, but it will be many years before this can be done judiciously without some investigation as to examination standards or some percentage requirement that shall make such investigation unnecessary.

It is understood that some of the State Boards have agreed among themselves that candidates passing a given percentage above the minimum standard, shall be allowed to register in other States than where they were originally licensed, without re-examination.

Under existing circumstances this would seem to be the only reasonable method of answering our query in the affirmative, and the writer is unable to see any serious objections to this plan.

HOW TO THICKEN YOUR PRESCRIPTION FILES.

By R. F. THOMPSON, Brooklyn, N. Y.

The drug trade is at ebb tide. We are suffering from what is known as "business depression," a condition not confined alone to pharmacy, but common to all trades and professions, even to department stores.

To quote a well-known writer, "Business depression means a lessening in the rapidity and volume of the exchanges." Consequently whatever measure will ensure an increase in the rapidity and volume of exchanges is a step in the direction of business prosperity.

I esteem it a high honor to be a member of this Association. It is an honor because you are a body of scientific men, and as such it is your province to regard all phenomena as being within range of science.

As chemical science treats of the fundamental laws that enter into the foundation of chemical compounds, so social science traces the fundamental laws that enter into exchange.

What is the primary cause of trade?

Trade results from a desire on the part of one person for a commodity of service for another person. Then so long as you have goods to sell, and so long as people desire them, trade ought to be brisk. If trade is not brisk under such conditions there is plainly something that keeps the commodity and the person desiring it from getting at each other.

You are all witness to the fact that people pass the door whose appearance bespeaks that they are in actual want of the very wares that crowd our shelves and show cases. Customers pay you five and ten cents for a tooth brush when they could get more comfort out of a thirty-five cent one. They pour oil and calomel and quinine into their stomachs when their symptoms clearly call for the special skill of a physician.

On the one hand, we see liquors fermenting in the closet. On the other hand we see the legitimate patrons of pharmacy accepting charity at the doors of public dispensaries. The reason for this is a self-evident axiom. The public do not buy because they have not the ability to purchase what they want. Therefore whatever increases the purchasing power of our patrons must increase the rapidity and volume of the exchanges and produce better times.

Most of the efforts to improve pharmacy have aimed to adjust trade, but not to increase its volume. When business is good tradesmen do not as a rule become feverish over adjustments. What we want is more trade. Give us this and other questions will largely adjust themselves. Is not our anxiety for stringent poison laws occasioned equally by the throes of trade and by the throes of humanity? You toil long, weary hours, not because druggists don't combine, but because you cannot with profit divide your time with clerks and partners. You take issue against department houses: not because they fit your feet cheaper than elsewhere, but because they advertise the shoes with nine cent Cuticura Soap. The physician is admonished for dispensing triturates: and he strikes back at a system of counter prescribing. The grocer is dubbed a species of Chinese Cooly: who in turn placards the druggist an extortionist.

While I deem it just to put proper regulations upon the sale of drugs, yet from a business point of view it is not prudent to make it the sole reform of pharmacists. Every attempt to restore prices by such methods is almost invariably followed by newspaper pratings of drug combines in order to provoke public opinion to beat us. When the purchasing power of buyers is co-equal with their desire for commodities, then, and then only, will the charges and counter charges of tradesmen disappear.

Are there too many engaged in trade?

The cost of trading is always added to the cost of production. Consequently the more there are engaged in trade, in proportion to the number engaged in production, the smaller will be the per capita earnings of our citizens.

If everybody wanted to trade, and no one cared to produce, the per capita wealth would be reduced. It is as foolish and wasteful for too many to engage in trade as it is for a merchant to employ ten men to do the work of five.

Competition is the best agent to regulate the number of traders. The firms that can conduct business with the least possible amount of waste can always compete successfully with firms that have not the same facilities. The natural effect is to transfer to the ranks of producers those least fitted to compete in trade.

This is what would occur under natural conditions. But alas and alack, man is wiser than nature. We have established an unnatural condition of things whereby the unsuccessful merchant finds that he has no alternative but to go to the wall. The avenues to production are cut off from him. He either hangs on to the tail of trade or spends his remaining capital looking for employment, or else slips the noose under his ears.

All this happens because we poor, long-suffering druggists have by our silence sanctioned a system of private ownership in Nature's opportunities for production which gives to one man power to say to his fellow-men, "You shall not build your factories and your homes; you shall not employ the brain and muscle of our nation, you shall not increase their power to purchase what they want; you shall not stimulate trade and increase the profits of our merchants. You and your capital shall remain idle; the cities must congest and cease to expand, until you have paid me for my land; not its actual worth to-day, but all I consider it will be worth in ten, fifteen or twenty years from now."

Unused land never yields us patronage. Factories and merchants always do. Unused land never increases the purchasing power of our customers. Used land always does.

Land speculation robs the merchant and destroys the equation that should exist between commodities and the desire for commodities.

The only remedy is to increase the tax upon the vacant land to that point at which it will be unprofitable for speculators to continue lessening the rapidity and volume of the exchanges.

This is how to thicken your prescription files. Will you do it?

IS THE PHARMACIST OF THE FUTURE TO BE A MERE STOREKEEPER OR A SKILLED MEMBER OF A PROFESSION?

By ALFRED B. HUESTED, Albany.

This is a question many thoughtful pharmacists have asked themselves, and some have even queried if the pharmacist of to-day is more than a mere storekeeper.

We are living in an age of change. New truths, inventions, discoveries and methods make to-day as different from yesterday as light from darkness. These changes are more sudden now than at any previous period of the world's history. In everything change tends to disorder and confusion, and a view on the surface gives the impression that disintegration and destruction, rather than growth or development, are taking place. There is no better way to understand the present and predict what the future has in store than by a survey of the past. If we compare every profession or business of to-day with what obtained even twenty years ago there are very few who cannot see that great changes have taken place in all of them. The doctor, the lawyer, the teacher, the clergy, the merchant, the manufacturer, and even the agriculturist—are they to-day what they have been in the past? Do they practice, do they teach, do they believe, do they carry on business, do they work to-day as they have in the past? Look at the most common mercantile business, that of supplying food to man, the grocer. Is his place of business, and his method of conducting it, what it was a few years ago? I fancy the merchant of twenty years ago would be almost as much surprised by the store of to-day as was Rip Van Winkle when he awoke from his long sleep.

And as we old timers in the drug business look back at what was, at the quiet, noiseless, inexpensive and pleasant methods of the past, at the leisure for thought and research, and the certain prospect of success were we but diligent and honest, and compare it with the excitement, hurry and expense and noisy shoutings of to-day, and the query of this essay arises.

I have said that by looking at the past we can better understand the present, and see into the future. In the early history of man, the individual and the nation was to the fullest extent self-reliant. He held within himself the knowledge and the art by which to satisfy all his necessities. As time passed necessities grew, and the means to satisfy them also grew, hence a certain division of knowledge and labor grew; self-reliance decreased and dependence or community of interests increased. Men began to separate into classes; first the teacher and worker only; then the merchant or trader class was formed, and these are the three great classes of to-day, to one of which, or a sub-division, every individual should belong. These three classes of men are equally honorable and naturally dependent. One class cannot be abolished without injury to the remaining. At first one individual represented the class; combination was the order, in teaching, in working and in trading. The teacher was the ruler giving laws; the clergy dictating religion; the doctor and pharmacist advising and supplying medicine for the sick; the laborer could work in any department, and the merchant dealt in all kinds of commodities. As time passed sub-division of these classes came. The evolution of the minister, the lawyer, the doctor, the pharmacist took place. As the sciences were evolved students and teachers of these became separate and distinct, some pursuing one branch, some another. Labor also became sub-divided. The education of man developed new wants, and the evolution of mechanics and arts furnished a vast variety of employment for the laboring classes. Merchants or traders followed the same course as the other two great classes of men, the educators and the workers, and sub-divided into dealers of single articles, or related lines of merchandise. This subdivision in the teaching or educational class of men has developed to a great, some think to its fullest, extent. The religions of the world are numerous, the sects of each more numerous, and the subdivisions of the teachers of these sects into evangelical, pastoral, missionary, theological, etc., obtains. The lawyer of to-day, instead of practicing in all the departments of law, as a rule confines himself to one—international, constitutional, municipal, civil, criminal, etc. The doctor, for a while preaching as well as practicing, in time confined himself entirely to the cure of the sick and wounded. The surgeon then separated from the physician, each in turn following many diverging avenues of thought and work, and the specialist is the result.

In the second class into which men are divided, the working or laboring class, this subdivision or evolution has been carried to as great an extent as in the educational. Some countries bring forth one kind of product, some another, as experience proves best. Some men develop one new mechanical device, some another, and localities even become removed for the manufacture of one article or varieties of it.

With the third class of men, the merchant or trader, subdivision has been the rule in the past, and is to some extent to-day. No one will deny that a change is in progress, and has advanced so far that it is the exception to find the merchant of one product or manufacture; the majority dealing in many, and not a few in almost everything needed by civilized man.

We cannot deny that this subdivision in educational pursuits has produced better systems of religion and more devoted and consecrated ministers; better laws for controlling the intercourse of man with man, and more profound expounders of the same; better knowledge of organic life, of the laws governing health and disease, and better doctors to advise and give relief. The agricultural and mechanical world has by this same subdivision of work progressed to an almost miraculous extent. The tempting fruit, and beautiful flowers, the wonderful inventions and discoveries, all point to this as the age of progress above and beyond all preceding.

The merchant or trader of to-day, with his avenues of trade extending around the whole earth, his transactions involving untold and almost inconceivable sums, is so far beyond the merchant of the past that the latter is not thought of in the same connection. The educational and artisan classes seemed to have reached their present development by a division of thought and work, by individual thought and work in one direct and unvarying line. No one can deny that this pursuit of one line of thought and research in the educational world, and one line of effort in the working world, has been the cause above all others for present attainment. The trader or merchant, however, appears to work on the principle that the laws which govern dealing in one article can be applied to others, and the greater the number the more successful and accomplished as a merchant he becomes.

You may ask now, what has all this to do with the query, and I answer, just this: The pharmacist has always been a worker in the three great classes, an educator or teacher in the line of medicinal and chemical research, a manufacturer in the production of remedial agents, and a merchant or trader in the sale of these products to those in want. The educational and manufacturing sides have in the past been more prominent, while the mercantile followed as a matter of course, and was in a certain sense of minor importance. The average pharmacist to-day in this country is more of a merchant and less of a searcher after knowledge and manufacturer than he was. Instead of dealing in medicinal agents only he has included many other lines of goods, and is yet reaching out for more. The life of the merchant is not conducive to quiet, to undisturbed thought and research. This condition has not arisen because of direct effort, or from lack of efforts on the part of the retail pharmacist, except in so far as he has gone out of his legitimate field and introduced into his stock articles foreign to pharmacy. It may be that in this commerce of articles foreign to the profession can be found the reason for the decline of the professional and increase of the mercantile side of pharmacy. I will not say that the pharmacist is entirely at fault for this condition, but he is to some extent, I think no one can deny.

The conclusions to be drawn from the preceding considerations seem to be that educational matters, the professions, the sciences, the arts, agriculture, mechanics, all the work of the first and second classes, into which we have separated men, are advanced by a division of labor, that is, by individual effort in one line, and that the third or mechanical class has reached its present standing by combination, that is, by dealing in numbers of articles, and apparently the greater the number the greater the success.

The student, discoverer and inventor cannot thrive in the busy haunts of trade. The true pharmacist has to a great extent been driven from the care of pharmacies in public places, to the laboratories of large manufactories, hospitals and schools. The retail pharmacist of to-day receives from these manufactories the great bulk of his stock in trade, and the prescriptions of physicians call directly in great part for this or that manufacture of goods, or this or that product made only by A, B or C.

The pharmacist of the future will be what the pharmacist of to-day makes of him, a merchant or trader, in proportion as he enlarges the variety of commodities in which he deals, or a professional or educational man—in the proportion in which he reduces this variety and endeavors to confine his work to the preparation, care and sales of such agents and work in such lines as are used in the cure of disease, relief of the wounded, and which promote a knowledge of the laws of health.

QUESTIONS FOR EXAMINATION.

OKLAHOMA TERRITORIAL BOARD OF PHARMACY.

PHARMACY.

1. Give the definitions for (a) Pharmacy, (b) Emetic, (c) Caustic, (d) Narcotics, (e) Febrifuge.

2. Give the official names of (a) Couch Grass, (b) Henbane, (c) Dogwood, (d) Bitter Sweet, (e) Bearberry.

3. Give common name for (a) Potassii Bitartras, (b) Calx, (c) Aspidium, (d) Crocus, (e) Hedeoma.

4. Give formula for Infusion of Digitalis.

5. What is the best solvent for Tannic Acid, Myrrh, Quinine, Gutta Percha and Tartar Emetic?

6. What is the dose of (a) Dover's Powder, (b) Tr. Aconite, (c) Tr. Nux Vomica, (d) Bromide Potassium, (e) Opium?

7. What per cent. of lime in lime water?

8. Give the ingredients in Belladonna Liniment?

9. What is the base of most official liniments?

10. How many grains of Cocaine in one ounce of 4 per cent. solution?

11. What are Gray Powders?

12. What is Huxham's Tincture?

15. How many grains in seven and one-half grams?

14. How would you tell Carbolic Acid from Creosote?

15. What per cent. of Mercury is contained in (a) Hydrargyrum Cum Creta, (b) Mass Hydrargyri, (c) Ungentum Hydrargyri?

16. How many grains in one pound avoirdupois?

17. Define the words Official and Officinal.

18. What is the National Formulary and by what authority published?

19. Translate the following ℞ into Apothecaries' Weights and Measures:
Quinine Sul., 1|
Ext. Glycyrrh., Fld. 4|
Strychnine Sulph. | 016
Syrupi 60|
Misce. Signa. Cochleare Parvum Ter die.

20. Correct the following ℞:
Morphine Sul. Gr. xxiv.
Atropia Sul. Gr. 1-10.
Aqua Pura Oz. 11.
Ft. Solution. Sig. Teaspoonful every four hours.

CHEMISTRY.

1. What is the difference between a molecule and an atom?

2. What is specific gravity.

3. What is heat?

4. What do you mean by Atomic Weight?

5. What is the symbol for, (a) Hydrogen, (b) Water, (c) Gold, (d) Zinc, (e) Sulphuric Acid?

6. How would you detect acid in solution?

7. Write out the following: (a) H_2O, (b) H_2O_2, (c) KI, (d) $FeSO_4$.

8. What is the principal source of Phosphorus?

9. Name ten elements and state their form, i. e., whether liquid, solid or gaseous.

10. (a) Define an element. (b) How many elements are known?

11. (a) What is an acid? (b) A salt?

12. What is an alkaloid?

13. Name three alkaloids in common use in medicine and give dose of each.

14. How would you detect morphine if mixed with quinine?

15. Name five chemicals that you would label poison and give properties.

MATERIA MEDICA.

1. Golden Seal—Give (a) synonyms, (b) official name and habitat. (c) Principal alkaloids obtained from it.

2. Give common name for the following preparations:
Liq. Ferri et Ammonii Acetatis.
Liq. Iodo Compositus.
Liq. Sodae Cloratae.
Liq. Ammonii Acetatis.

3. How many alkaloids have been obtained from opium? (b) What acids are found combined with them?

4. What is the stigma of a flower? (b) Mention a drug which the Pharmacopœia directs shall consist alone of stigmas. (c) Give official name of plant.

5. Give official name of plant and part from which the following are obtained: (a) Lycopodium, (b) Lupulinum, (c) Macis, (d) Kamala, (e) Kino.

6. (a) Name the part in which the pistil of a flower is divided. (b) What is meant by Cryptogamous plants.

7. Hæmatoxylon; (a) Give common name, (b) part of plant used, (c) habitat, (d) medical properties, (e) full botanical name.

8. (a) What is meant by Destructive Distillation. (b) Name a volatile oil obtained in this manner.

9. Is Tr. Belladonna made from the root or leaves?

10. Name the official preparations obtained from the class (a) Insecta, (b) Mammalia.

THE TINTOMETER is an apparatus used in the matching or comparison of colors. In the opinion rendered by General Appraiser Lunt of this port it is described as consisting of a wooden body, about 15 inches long and about 3 inches square, open at both ends, the interior being divided longitudinally into two compartments and colored black. This body is provided with a graduated support, and colored glasses of standard tints and silvered tumblers or glasses the comparison or matching of colors being effected by placing the glass of the standard color, or a glass containing a colored fluid, and the subject for comparison side by side, at one end, while the operator looks through the body above described toward the light.

A LABORATORY VACUUM APPARATUS.—Dr. Haussman offers a convenient form of vacuum apparatus suitable for a small laboratory. This consists of a porcelain vessel with a flat ground rim, over which a glass funnel with a ground rim securely fits, as shown in Fig. 1. Into the neck of the funnel a T tube is fitted, allowing the introduction of a thermometer and connection with a two-necked Wolff flask, which in turn is connected with a pump (Fig. 2).

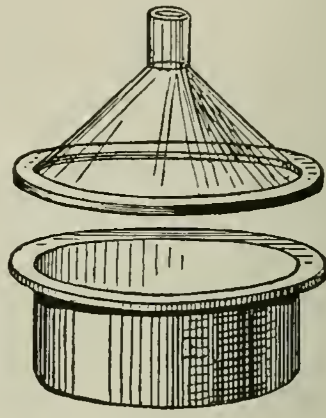

FIG. I.

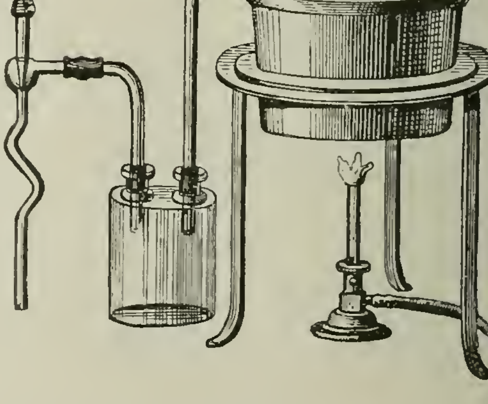

FIG. 2.

PHARMACY.

"GELATIN CLARIFIANT" is an imported clarifying agent, which, according to a chemical analysis made at the port of entry, consists of gelatin, 22.53 per cent.; acidity in terms of acetic acid, 1.83 per cent.; water 75.46 per cent.

FIBRITE is artificial sulphate of lime produced at the alkali works at Widnes, England. Calcium chloride liquor, which is the waste or by-product in the manufacture of bleaching powder, is treated with diluted sulphuric acid and the precipitated powder, when dried, is the product known to the trade under the above name.

TO CLEANSE SPONGES.—The sponges are first washed in warm water, which contains about 20 drops of sodium hydrate solution to the liter; this is followed by clean water; then they are immersed in bromine water and exposed to the sun until white, after which they are washed in water which contains 20 drops of sodium hydrate solution to the liter, followed then by clean water. They should be dried quickly in the sun if possible.

A COMPOUND OF ARGON AND WATER, in analogy with similar compounds of nitrogen or oxygen and water, has recently been obtained by P. Villard (Compt. rend., Sci. Amer.) in the same way as these latter are prepared. At a pressure of 150 atmospheres, argon and water were brought into contact. If then any part of the vessel containing the substances was cooled to 0° C., the thin film of water on the surface united with the gas to form colorless crystals which, at a pressure of 210 atmospheres, were decomposed at + 8° C.; at 105 atmospheres at by a temperature of 0° C.

CHLORHYDRINES AS SOLVENTS.—Epichlorhydrine (b. p. 117° C.) and Dichlorhydrine (b. p. 176° C.) have been proposed by Dr. Fleming (Chem. Ztg.) as solvents for the difficulty by soluble resins (as copal, amber, etc.), and particularly nitrocellulose and celluloid. These solvents have the preference over acetone, amylacetate, etc., because of their non-inflammability and inodorous nature. Epichlorhydrine dissolves nitrocellulose in all proportions; a 20 per cent. solution is so thick that it must be first diluted with alcohol before it can be employed for varnishing or coating objects. These solvents can be employed for cementing celluloid objects.

GUM RESIN—ESTER GUM is described, in a recent decision of General Appraiser Wilkinson, of the Treasury Department, as a translucent, amber-colored, brittle substance exhibiting the characteristics and appearance of resin and it consists of the distilled product of the ethereal salts of abietic or resin acid. It is a crude gum treated with alcohol to eliminate undesirable constituents and made into what is called an "Ester" gum. It is used for varnishes and for other purposes requiring a high grade resin, and is known in trade as a gum resin, a nonedible gum, and a drug advanced in condition by a refining process of manufacture.

SIMPLE METHOD FOR DETERMINATION OF PHOSPHORIC ACID IN WINE.—Thoerner and Uster recommend, after evaporating 25 cc. of sweet wine (port, Malaga, etc.) or 50 to 100 cc. of ordinary wine to about 5 to 25 cc., that 10 cc. of nitric acid (1.35) be added, covering the beaker with a watch glass and then warming on a water bath. After 20 to 30 minutes the violence of the reaction ceases, and when cold aqua ammonia is added in excess, followed by 25 cc. of ammonium citrate solution, finally 15 to 20 cc. of magnesia mixture. After standing 12 hours, the precipitate is collected, washed and ignited in the usual way.

A BACTERIUM WHICH LIVES IN ALCOHOL.—Mr. and Mrs. V. H. Veley communicate to Nature (Ch. & Dr.) an interesting note regarding the deterioration which has recently been observed in Demerara rum. They obtained samples direct from a bonded warehouse, which they found to contain 74.6 per cent. of alcohol by weight, and on microscopical examination of a sediment at the bottom of the samples found it to consist of chains of small cocci. After the spirit had been kept for some days the cocci were seen to be surrounded with a gelatinous envelope, and after a further interval of time the cocci were found disseminated throughout the liquid, and were rapidly developing and multiplying. The micro-organism belongs to the Coccaceæ, and the authors are inclined to regard it as a new species; indeed, the observation of the existence and multiplication of any micro-organism in a spirit of such alcoholic strength appears to be quite novel.

THE STERILIZATION OF WATER.—A simple method of sterilizing water has been published by Dr. Schumburg, chemist to the German Army Medical Academy, says the Practical Engineer (Sci. Amer.) He finds that the ordinary means of filtration by portable filters is unsatisfactory, but asserts that a solution of bromine destroys the pathogenic germs, and that the subsequent addition of ammonia renders the water palatable. Dr. Schumburg has made a number of experiments with water to which pathogenic germs had been added, and among them one or more in which a litre of water from the Spree was sterilized by the addition of 0.2 gramme of a solution of 20 grammes of bromine and 20 grammes bromine is removed by a dose of a 9 per cent. solution of ammonia. It is possible that some simple mixture may be devised, the addition of which to doubtful water will render it perfectly safe, so far as the pathogenic germs are concerned.

THERAPEUTICS OF LACTOPHENIN.—Dr. Geo. Howard Thompson contributes a second clinical report on lactophenin to the Tri-State Medical Journal. His first report was written a year ago. He says he has "continued the use of this valuable product with increasing satisfaction. It is a definite chemical body differing from phenacetin in that lactic acid replaces acetic acid, and this seems to overcome entirely the possibility of cardiac depression orthe conversion of hæmoglobin into methæmoglobin, an attribute only too frequently met with in antipyrin, acetanilid and phenacetin." He says further, "as an analgesic it is equal to the best pain reliever in the materia medica," and he quotes three cases in detail in which lactophenin achieved excellent results. The conclusion arrived at by the author is that his cases indicate to him "the great superiority of lactophenin over phenacetin and other memebrs of the coal-tar group of antipyretics and analgesics."

IRON FELT, A NEW INVENTION.—The U. S. Department of State has received the following from Consul Monaghan, dated Chemnitz, May 17, 1897:

Berlin and Leipsic are boasting about a new invention, to be known as iron felt. It is made of the very best woolen materials, impregnated with the inventor's patented preparation, which gives it 2,220 pounds' power of resistance to every square centimeter (0.3937 inch). The article is most useful for railroads of all kinds. Placed between rails and sleepers, it deadens sound and prevents shocks. The first experiments with the new material were made by the Berlin City Street Railway, over which three hundred and sixty trains pass daily. The results surpassed the company's most sanguine expectation. Not only was the noise brought down to a minimum, but the wear and tear was materially diminished. It is to be tried on the new roads in Leipsic. Old buildings, and particularly buildings of stone and iron, suffer most from the shocks and noise of passing trains. Such an insulating material seems to be specially adapted for elevated roads.

TOXICITY OF HUMAN PERSPIRATION.—At the French Biological Society, M. Arloing has reported some interesting observations on the toxicity of human perspiration. He found as a result of making intravenous injections of natural perspirations, and also of prepared extracts of the same, that when the strength of the injection approached 15 centigrams per kilogram in the case of the dog and 25 centigrams per kilogram in the case of the rabbit, death almost always occurred, generally within three days, though sometimes not for some weeks, when it followed upon a state of profound cachexia. The injection of one-sixth, one-quarter or one-third of a lethal dose led, according to his observation, to immediate and proportional effects. The toxicity varied with the environment of the subject which furnished the perspiration as well as with the mode of preparation of the extract. The perspiration secreted during arduous muscular toil is richer in toxic principles than that secreted during the ordinary circumstances of life, the degree of extra malignancy amounting to 25 or 30 per cent. All things being equal, perspirations obtained by artificial means of sudation present a minimum of toxicity; but perspiration obtained from a subject who has suffered from retention of the secretion due to cold is poisonous.

DIAMONDS.—In a recent lecture before the Royal Institute, Mr. William Crookes gave an account of the South African diamond mines, and, after briefly surveying the chief chemical and physical characteristics of the diamond, proceeded to say that speculation as to the probable origin of the diamond had been greatly forwarded by improvements in the means of high temperatures. Thanks to the success of M. Moissan, they could now be manufactured in the laboratory, minutely microscopic, it is true, but with crystalline form and appearance, color, hardness and action on light the same as the natural gem. The first necessity was to select pure iron and pack it into a carbon crucible with pure charcoal from sugar. Half a pound of this iron was put into the body of the electric furnace, and a powerful arc, absorbing about 100 horse power, formed close above it between carbon poles. The iron rapidly melted and saturated itself with carbon. After a few minutes heating to a temperature above 4,000° C. the current was stopped and the dazzling fiery crucible plunged in cold water until it cooled below a red heat. Iron increased in volume at the moment of passing from the liquid to the solid state, hence the expansion of the inner liquid on solidifying produced an enormous pressure, under stress of which the dissolved carbon separated out in a transparent, dense, crystalline form, in fact, as diamond. To obtain the diamond from the metallic ingot required a long and tedious process of treatment with various strong reagents, and the specimens thus obtained were only microscopic. The largest artificial diamond yet made was less than one millimeter across. Many circumstances pointed to the conclusion that the diamond of the chemist and the diamond of the mine were strangely akin in origin, and the diamond genesis must have taken place at great depths, under high pressure. How the great diamond pipes came into existence was not difficult to understand. After they were pierced they were filled from below, and the diamonds, formed at some epoch too remote to imagine, were thrown out of a mud volcano, together with all kinds of débris eroded from adjacent rocks. According to another theory the diamond was a direct gift from heaven, conveyed to the earth in meteoric showers, and the so-called volcanic pipes simply holes bored in the earth by the impact of monstrous meteors.

QUESTION BOX

The object of this department is to furnish our subscribers with reliable and tried formulas and to discuss questions relating to practical pharmacy, prescription work, dispensing difficulties, etc. Requests for information are not acknowledged by mail and ANONYMOUS COMMUNICATIONS RECEIVE NO ATTENTION.

Moore's Pilules.

(Wm. McL.) Exhaustive search has failed to reveal a formula for this article, and as we do not know the general nature of it we are unable to assist you.

Bottle Manufacturers.

(L. C. F.) There are many manufacturers of bottles, among the leading and most prominent ones being Whitall, Tatum & Co., of Philadelphia and New York; Swindell Bros., of Baltimore, and Tibby Bros., of Pittsburg.

Demand for Massachusetts Herbs.

(H. P. N.) who is not a subscriber of this journal, and, therefore, not entitled to its service, asks if there is a demand for any medicinal herb that can be raised in Western Massachusetts, in the Berkshire Hills. We print his query, thinking possibly some reader may be able and willing to assist him.

White Acid.

(G. H. H.) We know of no compound under this title, and a very thorough search has failed to give any satisfactory information. In the bleaching or "chemicking" of cotton, textile manufacturers use a bath of dilute sulphuric acid which they call "white sour." This bath is used to complete the process of bleaching, by washing the goods in it, after passing them through the bleaching solution proper. Possibly some of our correspondents may be able to give more satisfactory information.

Syrup Iron Iodide and Alkaloids.

(H. M. P. C.) submits the following prescription for criticism:

Tincture nux vomica	½ ounce
Syrup iron iodide	1 ounce
Quinine sulphate	1 dram
Glycerine	2 drams
Water to make	4 ounces

One dram to be taken before meals.

The difficulty here is the incompatibility existing between the syrup of iron iodide and the alkaloids, quinine and the strychnine and brucine in the tincture of nux vomica. There is no way of overcoming the difficulty, and the prescription should not be dispensed.

Dictionary of Pharmaceutical Terms.

(Junior) wants to know what dictionary he should procure and which will teach him to pronounce the words he meets in his reading pertaining to pharmacy, as he finds many pharmaceutical terms of which he wishes to know the proper pronounciation.

There is no work which is distinctly a pharmaceutical dictionary. For the pronunciation of pharmaceutical titles see the last edition of the United States Dispensatory. Gould's Medical Students' Dictionary ($2.75) will be found serviceable to a certain extent, although it is primarily intended for students of medicine. It gives the pronunciation of many words which are common to both medicine and pharmacy, and the definitions will be found of considerable help. A new dictionary recently published, but which we have not had the opportunity of seeing and examining, is Lippincott's Medical Dictionary ($7.00). This is said to be a complete vocabulary of the terms used in medicine and allied sciences, giving their pronunciation, etymology, definition, etc. Prof. J. P Remington, of Philadelphia, is one of the authors.

Medicated Uterine Wafers.

(E. J. N.) We cannot give you the formula for the proprietary article. Formula No. 1072 in the Era Formulary is a type of this general class of preparations, and we suggest reference to the Era, page 157, Feb. 15, 1893, under the heading, "Suppositories for Female Diseases." Following also are two other formulas from the Era Formulary, which may be of service.

(1) Boric acid	8 parts
Extract witch hazel	1 part
Alum	3 parts
Extract belladonna	⅛ part

Olive oil, a sufficient quantity.

Make into a stiff mass with the olive oil, roll and cut into suppositories weighing about thirty grains each, and wrap in tin foil.

(2) Zinc sulphate	60 grains
Alum	15 grains
Oil of almond	90 grains
Extract of hyoscyamus	10 grains
White wax	30 grains
Oil of theobroma	180 grains

Make into oblong suppositories weighing 33 grains.

Rosin Oil.

(W. & A.) Rosin oil is one of the two valuable products of the dry distillation of common colophony resin, or "rosin." In the distillation there is produced, first, from 3 to 7 per cent. of a light fraction, known as rosin spirit, or "pinoline," and second, from 70 to 85 per cent. of rosin oil, a violet-blue, fluorescing liquid, varying in specific gravity from 0.98 to 1.1. The pinoline is used as an illuminant, and as a substitute for turpentine oil in varnish manufactories. The rosin oil has a large use as a lubricant, especially for heavy machinery, wagon wheels, etc. It is used in the condition of "rosin grease" (made by stirring rosin oil with milk of lime), and is largely employed also as a substitute for linseed oil in the manufacture of printers' ink. It can be deprived of fluorescence in various ways (by exposure to sunlight, by treatment with hydrogen peroxide and nitro-benzene, dinitro-naphthalene, etc.), and, thus treated, is used in adulterating olive, rape and sperm oils. All this upon the authority of Sadtler's "Industrial Organic Chemistry," which also says that the best mineral lubricating oils are also adulterated with it at times. Rosin oil is a standard article of commerce.

Kidney Cure.

(W. F.) See Era, January 28, 1897, page 111. Here are a couple from the Era Formulary:

(1) Hepatica	1 ounce
Hydrangea	1 ounce
Scoparius	1 ounce
Apocynum cannabinum	1 ounce
Triticum	1 ounce
Hot water sufficient to make	10 ounces
Potassium nitrate	320 grains
Alcohol	3 ounces
Dextrin syrup	3 ounces

Fluid extracts may be substituted for the crude drugs, in which case the alcohol in the above formula is omitted, and the proportion of water reduced to 5 ounces, instead of 10, as above, the remaining ingredients being left the same.

(2) Senna	13 ounces
Buchu	2 ounces
Serpentaria	6 ounces
Bitter root	4 ounces
Wild cherry	4 ounces
Cinchona	4 ounces

Digest the senna and buchu for 24 hours with 10 pints of boiling water, then add 6 pints diluted alcohol, and let stand 24 hours longer; express. Treat likewise the serpentaria and bitter root with 6 pints of boiling water, and add 2 pints diluted alcohol as above; express. Treat likewise the wild cherry and cinchona with 4 pints of boiling water, add 2 pints diluted alcohol and express. Mix all these expressions, let stand 24 hours, and strain.

Stove Polish.

(L. C. F.) As you state that you are the possessor of a copy of the Era Formulary, we would refer you to the six formulas contained in that work, Nos. 4995 to 5000, inclusive. Chemical Recipes, an English work, gives some further information which may serve you, as follows:

(1) Molasses of good clear quality is heated to as high a degree of heat as possible in a steam-jacketed pan, and into it is worked as much plumbago as it will carry. The mass is then passed through flat stones until thoroughly mixed into a paste of the proper consistence, a few drops of sassafras oil or other essential oil being added during the process. Care must be taken to keep it clear of water or steam, otherwise it will mould.

(2) With sufficient water to form a cream paste mix together 2 parts copperas (good crystals), 1 part bone black and 1 part plumbago.

(3) Take 28 pounds best plumbago, 1 pint vinegar, 1 gill turpentine, 2 pounds carbon black, grind through stones, then turn out on a flat surface to dry a little; then put through a cylinder riddle, driven by power, cover with brass wire (60 to the inch), and fitted inside with brushes which keep the wire clean and brush it through if fine enough. Indexes to back files of this journal will disclose numerous stove pastes and polishes.

Female Regulator.

(W. F.) See formula under heading "Woman's Relief" in this journal for July 8 last, page 46. The following are repeated from earlier publication:

(1) Black haw bark	12 ounces
High cranberry bark	8 ounces
Blue cohosh	3 ounces
Life root plant	3 ounces
Sugar	4 ounces
Alcohol	32 ounces

Water, sufficient to make 1 gallon. Make a tincture of the drugs by percolating first with the alcohol mixed with an equal quantity of water, then with water until 1 gallon is obtained. In this dissolve the sugar and filter.

(2) Cramp bark	4 ounces
Partridge berry	4 ounces
Poplar bark	2 ounces
Unicorn root	2 ounces
Cassia	2 ounces
Beth root	1½ ounces
Sugar	24 ounces
Alcohol	16 ounces

Water, a sufficiency.

Reduce the crude drugs to a coarse powder; cover with boiling water, allow to stand until cold, and then percolate with water until 5 pints of liquid have been obtained. To the percolate add the sugar, bring to a boil; remove from the fire and strain. When cold, add the alcohol.

Kentucky Pharmacy Law.

(C. A. B.) The Kentucky Pharmacy Law, which was enacted more than a score of years ago, and amended in 1888 and 1893, applies only to towns and cities having one thousand or more inhabitants. The Board of Pharmacy consists of five members, who grant but one grade of license to applicants having three years or more experience, and who are not less than eighteen years of age. Graduates of schools or colleges of pharmacy incorporated by the general assembly of Kentucky, and which require three years' experience before graduation, are registered without examination. Graduates of incorporated schools of medicine who have practiced medicine for five years in Kentucky, and non-graduates who have practiced for ten years prior to the passage of the act, may register without examination. The registration fee is $5, and the certificate of registration must be recorded in the county where it is to be used. This costs fifty cents, and each year fifty cents must be remitted for renewal. The law includes the customary regulations regarding the sale of poisons, and the prohibition of adulterated articles. One striking feature is that prescriptions must be consecutively numbered and preserved for two years, and that the pharmacist is compelled, upon order of the attending physician, to issue a duplicate.

At the last meeting of the Kentucky Pharmaceutical Association, held at Crittenden Springs, the legislative committee submitted the draft of an entirely new pharmacy law which was adopted by the association. The Legislature will be asked at its next session to enact this. We cannot print the proposed law in full, but suggest that you can probably secure a copy on application to the secretary of the board, J. W. Gayle, Frankfort, Ky.

Red and Blue Show Globe Colors.

(A. W.) We have repeatedly published formulas for all manner of show globe colors in the Era. However, we give you the following taken from the Era Formulary:

Red.

(1)	Distilled water	970 parts
	Sulphuric acid	20 parts
	Cochineal	6 parts
	Bitartrate potassium	4 parts
(2)	Distilled water	970 parts
	Sulphuric acid	10 parts
	Cochineal	8 parts
	Alum	8 parts
	Pure cream tartar	4 parts
(3)	Distilled water	880 parts
	Ammonia water	76 parts
	Nitric acid	32 parts
	Cobalt metal	8 parts
	Alum	4 parts
(4)	Carmine	3 to 5 grains
	Chloride of tin	3 to 5 grains
	Water of ammonia	1 dram

Water, enough to make 8 pints.

Dissolve the carmine in the water of ammonia; add the chloride of tin and water.

Blue.

(1)	Distilled water	920 parts
	Blue vitriol	30 parts
	Alum	30 parts
	Sulphuric acid	20 parts
(2)	Distilled water	950 parts
	Ammonia water	40 parts
	Sulphate copper	10 parts

Any desired shade can be obtained by varying the proportion of ammonia and copper salt.

(3)	Sulphate copper	160 grains
	Solution potash	1 pint
	Glycerine	¼ pint
	Water	16 pints

Dissolve sulphate of copper in sufficient water, add to the solution potash, then glycerin, until complete solution results. Finally add the remainder of the water.

Depilatory.

(J. J. E.) inquires concerning a powder used in Hungary, called razorless powder, which is rubbed on the face, dampened with water and then scraped off, leaving the face as smooth as if freshly shaven. This is undoubtedly one of the many depilatory powders for which this journal and other pharmaceutical papers very frequently give formulas. Here are two or three of standard type for this kind of preparation.

(1)	Sodium sulphhydrate	100 grains
	Slaked lime	80 grains
	Starch	20 grains
	Lime water	4 fl. drams

With the aid of water this powder is converted into a soft paste, and applied to a hairy skin in a layer as thick as a straw. After drying, about ten minutes, the pellicle is scraped off with a paper knife, or similar blunt instrument, and with it the hair. The face should be washed clean and annointed with some bland oil.

Sodium sulphhydrate is prepared by supersaturating at ordinary temperature a solution of sodium hydrate of specific gravity 1.35 (made from 1 av. ounce of caustic soda and 2 fluid ounces of water), and then setting aside the well-closed jar for several days in a cold, dark place, when the crystals formed may be removed and preserved in a well-closed vial, protected from the light.

(2)	Orpiment	1 part
	Slaked lime	5 parts
	Starch	3 parts
(3)	Quicklime	120 grains
	Sodium sulphide	240 grains
	Starch	80 grains
	Orris root, powder	40 grains

Rub the necessary portion of this powder into a thin paste with water, and apply as directed for No. 1.

Our subscriber is doubtless posted regarding the fraud shaving stone which was quite fully exposed in this journal a year or so ago, but which is cropping up from time to time in various localities.

Flux Syrup, or Diarrhœa Remedy.

(F. D. B.) We cannot give the formula for the proprietary preparation. However, besides the various preparations in the National Formulary (Diarrhœa Mixtures, Blackberry Cordial, Compound Elixir of Blackberry, etc.), we quote the following two from the Era Formulary:

(1)	Powdered gum arabic	15 grams
	Distilled cinnamon water	15 grams
	Distilled mint water	10 grams
	Syrup of quinces	20 grams
	Extract of opium	5 to 10 centigrams

It is mixed with a half tumbler of water when wanted for use, and of the mixture a tablespoonful taken every hour.

(2)	Blackberry root, bruised	8 tr. ounces
	Cinnamon	3 drams
	Cloves	3 drams
	Nutmegs	3 drams
	Sugar	4 pounds
	Water	4 pints

Boil the root and the aromatics in the water for one hour: express and strain; then add the sugar, form a syrup, and again strain; then add:

French brandy	6 fl. ounces
Oil of cloves	4 drops
Oil of cinnamon	4 drops

Dose, a teaspoonful for a child 2 years old, to a tablespoonful for an adult, as occasion requires.

The Standard Formulary gives the following for Flux Syrup, which may be satisfactory:

Camphor	2¼ av. ounces
Fluid extract of rhubarb	3½ fl. ounces
Oil of peppermint	1 fl. ounce
Tincture of capsicum	6 fl. ounces
Tincture of opium	10 fl. ounces
Chloroform	4 fl. drams
Sodium bicarbonate	8 av. ounces
Alcohol	64 fl. ounces
Simple syrup, enough to make	1 gallon

Dissolve the camphor and oil in the alcohol, and add the chloroform and two tinctures. Mix the fluid extract, sodium bicarbonate, and a portion of the syrup, let stand in an open vessel for several hours, then add to the previous mixture, add the remainder of the syrup, and filter in a well-covered funnel.

A Question in Grammar.—Mr. Kink (to a professor in Biddle University)—Perfessor! "Well, Mr. Kink?" "Which is the past tense of the verb 'to hoodoo'—hoodone or hoodid?"—Harlem Life.

A drug clerk in this city bluffed a school teacher with the argument that the friction of wind upon the bacteria in the air was the cause of heat. And the school teacher right in company admitted the staement in earnest, and will probably work it off on his class in physics.—Wichita Eagle.

TIME TO WAKE UP
to the fact that there is a prize offered to the advertiser who receives the most replies to his advertisements in the Era during July and August. Watch the ads. and answer those that interest you.

THE PHARMACEUTICAL ERA

[*WEEKLY.*]

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LECTURES BEGIN SEPTEMBER 2.

It is very desirable that all who intend joining the class for instruction in the Era Course in Pharmacy should apply for matriculation at once. During the remaining issues for August important announcements and directions will be presented in order that students may be well prepared to commence the active work of the course, which begins September 2.

Students joining after the lectures and quizzes have been some time in operation will find it harder to catch up and continue with the class.

THE COMPLETE PROSPECTUS, in pamphlet form, giving full particulars and containing matriculation blank, will be sent to any applicant. See also Blue Insert, opposite page 176, in this issue.

Address, THE PHARMACEUTICAL ERA,
P. O. Box 1483, New York.

The New Tariff.

At last has come surcease of our woes. For many weeks, yea months, the business world has been fretting under the hardships imposed by the vacillations and dilatoriness of our national lawmakers with reference to the great tariff question. This fret and worry finally developed into a feeling almost of despair, of indifference at least, and the sentiment was freely expressed by the merchants that almost any old thing in the shape of a tariff act would do, only they must have something and that very quickly. But the tariff act is now passed, signed and in operation, and in the main seems fairly satisfactory, and a great peace of mind, coupled with a revivification of the spirit of hustle, is in evidence in business circles. The long and vexatious wait is ended, and all are ready to go to work in earnest.

The new tariff provisions as they affect drugs and chemicals were printed in last week's issue of this paper. Each reader can estimate for himself how they will influence his own particular business interests. There are a number of changes, however, which are of special interest and importance.

Crude opium, formerly free, must now pay a duty of one dollar per pound, and, in conformity, morphine's tax is doubled, from 50 cents an ounce to one dollar. Most of the leading changes are in the way of increase. Borax is raised from 2 cents per pound to 5 cents, and boracic acid from 3 to 5 cents. The duty on calomel is increased from 25 per cent. ad valorem to 35 per cent., and vanillin, which was formerly taxed at 25 per cent. ad valorem, now shoulders a specific duty of 80 cents per ounce.

There is quite a number of articles formerly free which must hereafter pay duty. Of these, bleaching powder is to be assessed 20 cents per hundred pounds, resublimed iodine 20 cents per pound, gum chicle 10 cents, croton oil 20 cents, salicylic acid 10 cents, chlorate of potash 2½ cents.

The distributing trade is very busy just now revising price lists and pricing goods in accordance with the changed conditions. Retailers are concerned to the extent that they should study the effect of these changes upon their own business.

Toxicity of Wood Alcohol.

A woman died in this city the other day after drinking a pint of wood alcohol, and death was attributed to that article as the cause. Possibly the same amount of grain alcohol would have produced a like result, but the point of greatest significance to us in this case is that wood alcohol is by no means the harmless beverage some seem to consider it. On the contrary, it is pretty generally held by the medical fraternity to be a dangerous article for internal use, an opinion supported by the fact that as a medicament it is employed in very small doses, but 20 minims or so. In the methylation of grain alcohol, to prevent the use of the latter as a beverage, it is assumed that, beside its burning taste and cognate disagreeableness, the poisonous nature of the wood spirit will deter the would-be imbiber.

It is proper and desirable to repeat the oft-repeated warnings against the internal employment of wood alcohol, the more insistently that the article is coming into wider use for numerous industrial purposes, and is advocated for the preparation of liniments and the like for external application and even for articles intended for internal administration, but in which, when completed, the alcohol is supposed not to remain. Druggists should use it with carefulness in their own compounding, and in its sale should in some way guard against its improper employment, by cautioning the customer and informing him of its nature.

Must the Chinese Druggist Register?

Over in Boston a few days ago several Chinamen were on trial in court charged with keeping their stores open on Sunday. Then was presented a very pretty problem. Some of these Chinamen claimed to be druggists and, as such, to have the same right to keep open store on the Sabbath as the druggists of any other nationality. But the Celestials were informed that they are not druggists in the eyes of the law, not being registered by the board of pharmacy, and are therefore liable to prosecution for illegally doing business as pharmacists. So it is that these poor Chinamen are between the devil and the deep sea. The same state of affairs exists in all other cities which have Chinese druggists, New York, San Francisco, Portland, etc. Not one of them, so far as known, is a duly registered pharmacist, nor could he pass an examination if he tried.

The law is thus being continually violated, but the chances are the Mongolians will not be molested so long as they do not attempt to build up among the white men a trade in dried snails, mummified lizards and the like. If needs must, we'll make them take the board examination, but just think of attempting to express a complex graphic formula in Chinese characters.

Early Closing.

Every one admits that drug stores are kept open too many hours, or rather that druggists and their employés are kept on duty too long. But, though we find almost an unanimity of opinion in favor of the early closing question, the question seems to be, how is it to be done? It's apparently a case of "one's afraid and the other dasn't." Druggists might just as well at the start relinquish the idea that they must wait till every one has agreed to it, before they close up early. If they wait for this the judgment day will see them still on the seat of expectancy. The way to resume is to resume, and druggists are beginning to realize that if they want early closing they must go ahead and close. Waiting for one another will render the plan abortive.

There are early closing movements in many sections just now, in New York, Philadelphia and other large centers as well as in many smaller cities, towns and villages. In some localities early closing is an accomplished fact, and in not a few it has reached an age which assures its stability and permanence. In the cities, it is hopeless to get all and every one of the many druggists to agree to the same thing. The result is here best accomplished by deciding it sectionally, or by districts, or, dernier ressort, going it alone. It is, after all, purely a matter of personal rights. A man cannot be forced to close his store if he doesn't wish to. If argument and gentle suasion do not move him, leave him alone.

New Orleans is one of the latest cities to be worried by this question. The ladies of that city have become much interested in an early closing movement for the summer months, and some enthusiasts formed a committee, circulated a paper which was signed by a large number of the leaders of society pledging themselves to do no shopping after noon on Saturdays or after 5 p. m. daily during the three months of summer, and succeeded in getting the large department and drygoods stores to close at the same hours. Now, the drug clerks want to enlist the aid of these ladies in their battle for fewer hours, are writing letters to the papers, and the matter is receiving liberal discussion. The papers are friendly to the project and one of them says that if the four, five or six leading drug stores would agree to observe the half holiday movement, they could prove that no disadvantages would accrue to themselves while they showed the Southern side of their hearts to their worthy employés.

If this summer arrangement is a success it should not be very hard to extend some modification of it to the entire year.

To shut up or not to shut up, that is the question:
Whether 'tis nobler (in your mind) to keep open all night
Or to take arms against this sea of troubles,
And, by early closing, end them?—To close—
To shut up:—to end the thousand natural troubles
That pharmacy is heir to,—'tis a consummation
Devoutly to be wished. To close; to sleep,
And sleep! perchance to dream of losing nickels
Must give us pause: There's the loss of sales,
The belated customer's contumely, and the spurns
That patient merit of the unworthy takes.
But there's the dread of something after closing,
The probable bankruptcy from whose bourne
A retail druggist hardly e'er returns
That makes him rather bear the "open-all-night" ills
Than fly to early closing that he knows not of.
Thus the pocketbook doth make cowards of us all,
And thus the native hue of resolution
Is sicklied o'er with the yellow cast of thought,
And early closing enterprises of great pith and moment
Their currents turn away and lose the name of action.

The Abuse of Antipyretics.

The average man considers that, in the exercise of his God-given right to liberty, he can do as he pleases. This right includes first and greatest of all the ownership of his own body and the privilege of treating or maltreating that body as his fancy, whim, reason, or prejudice dictates. In no respect is his conviction in this direction shown with greater positiveness and emphasis than in his attempts to cure or alleviate the ills afflicting that body. And why should he not cherish this right? It is only when it is mistakenly and ignorantly exercised that he should be warned and corrected.

All of which leads us to the proposition that, while he possesses the right, it is from the nature of things a serious error in many instances for him to diagnosticate his ailment, prescribe the remedy and administer the dose. Self-prescribing can never be done away with, but much can be accomplished in the way of education of the people with respect to its dangers and responsibilities. The physician, with special training and education, has been accused of treating disease, of which he knows little, by putting medicines, of which he knows less, into a body of which he knows nothing. If this charge against him is true in any degree, how much more weight it has when directed against the layman.

Physicians have noted with alarm the rapid growth and wide extension of the practice of self-prescribing since the production and introduction of the countless synthetic remedies whose virtues are exploited in the general and lay press as well as in the professional and scientific publications. They find a very serious danger in the universal habit among the people of dosing themselves on any and every pretext, with this or that —in or —ol. ad libitum, ad infinitum. Have I a headache, I go to a drug store and purchase 5 or 10 grains of some favorite drug, or perhaps I take a tablet or a pill from my pocket supply. It is proven that this drug habit is very serious. Some of these drugs are not yet fully investigated in their action and results, some are known to produce alarming effects, some are said to be cumulative and therefore the more dangerous in their continued administration, and of all of them is it asserted by those who know them best that they should be given only upon the advice of prescribers qualified to diagnosticate the ailment and choose the fit remedy.

But the sale of these articles is absolutely unrestricted. One may buy them by the grain, or ounce or pound at any drug store, and he can dose himself, family and friends to his heart's content.

We can only call attention to the evil; we cannot frame a remedy. Possibly restrictive legislation might be effective to a degree, but the people resent any interference with their rights in this regard. A campaign of information would seem to be about the most feasible and promising line of action. If we can do no more, we can at least urge druggists to exhibit every possible precaution and careful judgment in the traffic in these goods, remembering that they are held answerable for much more than the ordinary tradesmen, they are the conservators, with the physicians, of the health and life of the people.

The cutting problem in Louisville, Ky., is assuming a new phase, as explained by the correspondence published in this issue. The druggists there are planning to absolutely refuse to put in stock any patents on which there is no profit. By this means they claim that they will be free from the accusation of substitution, and they cannot be expected to sell goods which afford them no profit. In the past, the druggists of Louisville have been well organized, showing that they were capable of pulling together, and if they stand united on this proposed plan their action will probably be felt by druggists in other localities, and is sure to force a solution of the patent medicine cut-rate problem.

The druggists of Canton, O., complained to the State Dairy and Food Commissioner that the local hardware men were violating the law by selling paris green without labelling it poison. One firm pleaded guilty in court and paid twenty dollars and costs. Ohio druggists evidently believe that what is sauce for the goose is sauce for the gander, and are getting a little retributive satisfaction for their own prosecutions during the past two or three years. But, they're right any way. If there's a poison law, enforce it.

In Columbus, O., a druggist is in trouble. It is alleged that a physician's certificate on which a burial permit was issued signed "W. C. Scoles, Pharmacist," and stated that death was due to "pharamecis of the bowels, caused by thrush." The authorities want to know what authority a pharmacist possesses to sign death certificates, and are anxious to learn the nature of the disease "pharamecis." Mr. Scoles will have an interesting time if he attempts satisfactory replies to these inquiries.

The free dispensary must go, and one of them, at least, has gone. The Englewood (Chicago) Union hospital has discontinued its dispensary. It was found after months of trial that it was being abused by people in the vicinity of the hospital who were in many instances able to pay for their prescriptions and drugs. Nearly, if not quite, all hospitals having dispensary adjuncts could tell the same story if they would.

The correspondent of a country paper sends in the following surprising item: "Mr. James B. Betts of this place was run over and killed by a train early yesterday morning. A similar misfortune occurred to Mr. Betts about two years ago."

A Western paper, with ideas of its own as to the proper method of receiving pay from those it serves, has printed the following editorial: "Persons knowing themselves indebted to this office are requested to call and settle. All those indebted to this office and not knowing it are requested to call and find out. All those knowing themselves indebted and not wishing to call are requested to stay in one place long enough for us to catch them. All those who are not indebted are requested to call and get indebted."—Ex.

Correspondence

We are pleased to publish here communications from our readers on topics of interest to the drug trade. Writers are requested to express their views as briefly as possible. Each article must be signed by its writer, but his name will not be published if so requested

To Throw Out Patents.

Louisville, Ky., July 27, 1897.

To the Editor: At a recent meeting of the retail druggists of this city, together with representatives from the neighboring towns, a communication was read suggesting that the druggists should refuse to keep in stock or offer for sale any of a list of proprietary medicines which are now offered at cost, and in some instances at less than cost. Included in this list were the preparations of Hood, Wells, Richardson & Co.'s full line, Cuticura products, Carter's Pills, Castoria, etc. This proposed action had been discussed by many of the prominent druggists, and the conclusion was reached that the articles mentioned, if sold would have to be sold at a loss, and if a higher price than the "cutter" asked should be demanded, a customer was lost, not only for this particular purchase, but for the future. Several of those who are ripe in experience concluded that if this plan, if generally agreed upon, would place the profession on a higher plane than it is now, and if these preparations were not kept in stock a perfectly legitimate demand for the druggist's preparations would naturally arise, and there would be no charge of "substitution." While action on this particular line has been temporarily deferred, still there are many who openly advocate an immediate resort to this.

In this city there are fully 150 retail stores, and counting in the towns surrounding, fully 200. If 125 of those in the city should determine to throw out "patents," especially those that are so extensively advertised, it would no doubt almost entirely destroy any demand that there is now. But the druggist could, by anything like reasonable energy, soon be in absolute control of his neighborhood patronage, and consequently a fair return for his labor in the way of some profit would result. Besides, a move of this sort would no doubt be "catching," and other cities and towns where the business is in an equally unprofitable condition, as it is here, would adopt a similar move, and no amount of money that the proprietors could expend in the way of general advertising would prove effective when the outlet to the public would be closed and the interest and co-operation of the retailer have been lost. A city salesman remarked, upon this suggestion being mentioned, "that 95 per cent. of the retailers would willingly obligate themselves to discontinue the sale of patents that are totally without profit."

If the proprietors would discontinue sales, direct, at quantity prices to retailers, discontinue sales to wholesalers with retail departments, or retailers with wholesale departments, the great, and possibly the only, source of "cutters" supplies would be effectually stopped. Then if they would obligate the jobber to refuse supplies to cutters—willing "cutters"—the business would resume its normal condition, and prices be restored. We have one —only one—willing cutter in this city, yet the business is thoroughly demoralized. He, no doubt, buys direct, and all the goods, that is the surplus, that he cannot use legitimately goes to some other cutter, wholesale or retail, in some other city.

There is no question that if the proprietors do not make some arrangement that will make it a source of some profit for the retailer to stock and sell their products (and that, too, very soon), the present avenues of reaching the general public will be closed, and a few aggressive cutters and the department stores will be their only patrons. Some of the stores in this city now carry a limited line of patents; others say they are having a small demand, and in the course of a year, if the present conditions continue, the druggist will become so accustomed to offering and selling his own preparations, and his patrons becoming willing purchasers, that there will be no incentive for him to carry patents—no matter what concessions the proprietors should then be willing to make. While the retail stores as a general thing are carrying fair stocks of the prepared proprietary medicines, at present, they are all looking forward and hoping for a change in present conditions. Any casual observer can see from the window displays that stores that never thought of stocking "non-secrets" or putting up remedies of their own production, have full supplies of these goods on exhibition, and they are selling them at a profit. The profession here, as a rule, can be readily united, and should the proprietors, at their approaching meeting, do nothing toward improving the business condition of the retailer, affording a legitimate profit, the demands for patents, so far as this city is concerned, will be considerably lessened—if not totally lost.

"ANGELINE."

THE HAMMER TEST.

Brooklyn, N. Y., July 24, 1897.

Editor Pharmaceutical Era:

Under the misleading caption, "A Résumé of the Friable and Mass Pill Controversy," the Monthly Retrospect of June 15 prints the claims of one side to the pill makers' controversy which has followed upon the heels of the "Pills Under the Hammer" article in the Era of Dec. 10, 1896. I have no desire to make this "controversy" a three-cornered fight; but as many of these statements attempt to place a construction upon my previous article not warranted by the text, I ask further indulgence in your columns to make my position clear.

My experiments with pills were intended to draw attention to the well established fact that mass pills harden with age, and the natural conclusion from a pharmacist's standpoint was briefly summed up as follows:

> "I make no comment on the solubility of a pill, whether coated or uncoated, which is of sufficient hardness to penetrate a pine board. I feel justified, however, as a pharmacist, in contending that the interests of the physician, the patient and the druggist as well, are better served by pills extemporaneously prepared, or, in any event, by the use of such manufactured pills as are known to be in a permanently soluble condition."

Whether intentionally or otherwise, my critics attempt to sidetrack the real question by exploiting a false assumption, expressed in one form in the following quotation from the "Résumé":

> "What, therefore, no doubt appeared to its originator as a thing which would demonstrate that mass pills are, and have been, a worthless class of preparations, resolves itself into simply an amusing pastime."

But I am not unfriendly to mass pills; in fact, nothing pleases me better than to make them at my prescription counter. Yet, by shrewdly ignoring the distinction between commercial coated mass pills and those extemporaneously prepared, and by premising that the solubility of both was questioned, the champions of the ready-made mass pill have been enabled to set up a man of straw which they have industriously belabored.

Their statements are at times conflicting, but upon one thing they are agreed, viz.: that to hammer pills into a board without breaking their coating is "puerile," "silly," "ridiculous" and what not, and above all that the writer is an "ignorant" fool. I will not discuss the latter proposition, as it is, to a certain extent, a personal question upon which I acknowledge my inability to form a strictly unbiased opinion. I feel, however, that I am less perturbed at this line of criticism than are my critics when they behold a pill driven into a board or through a piece of lead pipe. On other points they are in such thorough accord. We are told, for instance, that pills which are driven through a board are not the least bit hard, and then again that even if they are hard it's all right, anyhow. As a contributor to this "Résumé" puts it, "No matter how hard they are, they are soluble and have an efficacious effect." To urge this seriously is to fly in the face of all past experience. In fact, one of the stanchest champions of the ready-made mass pill shows that he believes a soft mass to be a good thing. In "An Endorsement of Soluble Mass Pills" in the same issue of the "Retrospect," he says, "I was not afraid to use the old pills for two reasons; first, the sugar-coating was soluble in the juices of the stomach, and, second, the mass was soft. Therefore, I was sure they would disintegrate and be absorbed!" Exactly! The pill was soluble because the mass was soft, but, unfortunately, this condition does not always exist.

But it is claimed that the "hammer test" fails to prove that some pills are harder than others. Is this true? Is not a pill which penetrates a board harder than one which, under the same pressure, flattens out without making a dent in the wood? If hammering the pills fails to satisfy any one, a physical examination is all that is necessary. I have cracked open old gelatin coated quinine pills which presented a tough, horny appearance upon the inside bearing no closer resemblance to the powdered drug than does a rusty nail to reduced iron.

This progressive hardening is the most natural thing to be expected when one considers the process of forming a pill mass. The medicinal ingredients are first reduced to a powder when possible. Why? Because, "the pulverulent condition is well known to be the most favorable solid form for solution in the gastric fluids." If these mixed powders were then enclosed in a soluble coating there could be no question as to their assimilability. This may be done extemporaneously by the use of gelatin capsules or, preferably, rice flour wafers. A filling and closing apparatus for the latter has been devised which is at once unique and rapid in operation, and the finished wafers are a desirable vehicle for powders even in bulky doses.

But in a pill mass the particles comprising the active ingredients are bound together by the addition of an adhesive excipient containing moisture. When freshly prepared this mass, no doubt, ranks next to the powdered form in assimilability, but in the course of time the excipient hardens by evaporation of moisture, as does mucilage or glue, and it becomes more and difficult to separate the component parts one from the other. A lump of moist clay, rounded into pill form, may be easily broken into small pieces by the fingers and readily disintegrates in running water; but not so after it has lost its moisture by being thoroughly sun baked. Neither are dried apples considered more digestible than the fresh, ripe fruit.

Two facts stand out in bold relief:

1. The pulverulent condition is the most favorable solid form for solution in the gastric fluids.
2. Mass pills harden with age.

Yet it is asked, "Does hardness affect their solubility?" Is a lump of rock candy more readily dissolved than powdered sugar? In this connection statements of mass pill makers themselves are interesting as confirming, perhaps unintentionally, the teachings of the past. One maker widely advertises that some of his pills "dissolved" in 20 minutes. These were presumably fresh, as the test was conducted by his own chemist, to whom fresh pills were accessible. Another maker advertises that "Many pills in our possession, manufactured as long as ten years ago, and 'as hard as bullets,' we have yet found to disintegrate in less than twelve hours when placed in cold water."

Twelve hours to disintegrate an old pill, while a fresh one "dissolves" in twenty minutes! Does not this show that the solubility of mass pills is impaired by hardness due to old age? I pass over the well known fact that, in numerous cases, coated mass pills pass from the patient undissolved, and admit the disintegrability of this class of pills when recently prepared, but until manufacturers are willing to enlighten us by placing a date stamp upon their bottles, there is no way of telling which kind is dispensed. The physician might want the twenty-minute kind and get the twelve-hour one instead.

In view of these facts, is not the pharmacist justified in pointing out the advantages of extemporaneously prepared pills, and is not the physician interested in getting the full effects from drugs administered in solid form? How this may be assured may be considered without invidious comment. It is results the doctor wants, and the means best adapted to that end will find favor, whether "friable" pills, powders or wafers.

As a retail druggist I advocate extemporaneous pharmacy. But, as in my previous article, I acknowledge a certain utility and convenience in ready-made pills, and know that they will continue to be used. Still, all pills do not "look alike to me," and the impartial investigator will also find a difference even among those ready-made. Medicine and pharmacy will be gainers if the "controversy" demonstrates which class possesses to the fullest extent the elements of permanent disintegrability.

J. FRED WINDOLPH.

NO HOPE.—Family Doctor.—"Nothing more can be done for you, sir. I have exhausted my resources and advise you to make your will."

Patient.—"But I have been told that Dr. B. says he can cure me."

Family Doctor.—"Huh! I'd like to see him try it. I'd have him turned out of our Medical Society."

Fogg (looking up from book): "The heroine appears to be as versatile as one of those bottles from which a magician pours all kinds of liquors."

Fenderson: "How so?"

Fogg: "Why, in one place it says she wept bitterly, in another that the salt tears coursed down her cheeks, and in the very next paragraph we are told that her tears broke out afresh. A gifted woman that."

A political orator made the following statement: "We congratulate ourselves most on having torn off Mr. Smith's mask and revealed his cloven foot. It was high time that the hydra-head of faction should be soundly rapped over the knuckles."

THE ERA COURSE IN PHARMACY

A PRACTICAL, THOROUGH and ECONOMICAL COURSE OF

Home Study in Pharmacy

UNDER THE DIRECTION OF

J. H. BEAL, Sc.D., Ph.G.

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NOTICE TO PROSPECTIVE MATRICULATES.

The director wishes to emphasize the importance of immediate matriculation. All who expect to pursue the Era Course in Pharmacy should enter their applications now. Some important announcements are to be made which will be received only by matriculates. The last weeks before the opening of the lectures will be busy ones, and applications received during the rush will have to be filed until they can be reached in regular order.

Drawing Exercises.

It is recognized by every experienced instructor that practice in drawing is a valuable aid to students in the study of the natural sciences.

The usual objection of the student, when requested to draw the outline of a drug, that he is without skill as a draughtsman, is due to a misunderstanding of the purpose of the instructor in prescribing the exercise. The aim of the latter is not to secure a picture of the article under consideration, but to lead the student to a deeper and more accurate knowledge of the thing studied. The work is assigned because the instructor's experience has taught him that in the attempt of the student to convey to paper the outlines of the object before him, he will discover details of structure and characteristic features of whose existence he would otherwise have remained unconscious.

It is hoped that students of the Era Course will not fail to avail themselves of the benefit of all such exercises which may be assigned. As a result he will be rewarded by a newer and deeper insight into the things about him, and will be surprised at his progress in the art of drawing.

The Use of the Dictionary.

Another important help which the wise student will not fail to avail himself of, is a constant and systematic use of the dictionary. All the learning and culture of the ages are there preserved, and available to all who make the effort to obtain it. It would be possible to construct a complete history of the cultural progress of a people or of the development of a science simply from the language employed by that people or science. In this respect the English language is richer than any other, and an inexhaustible source of knowledge for all.

A word not understood, or misunderstood, is of no benefit or perhaps a positive detriment to one who remembers it. Every new word, every strange term, should at once be looked up in the dictionary, or at least noted down for investigation at the earliest leisure moment. Not only should the spelling, pronunciation, and formal definition be learned, but especial attention should be paid to tracing out its etymology, or the meaning of the root word from which it comes. By so doing the learner will gradually acquire a stock of root words which will enable him to almost instantly seize upon the meaning of new terms, based upon these roots.

All this may seem very troublesome, and unnecessary to one who has not tried it, but to one who has acquired the dictionary habit it is a far easier and more agreeable task to take up the dictionary than it is to lay it down.

As a rule, the regular standard English dictionaries will be found more useful for all around service than any of the special medical or technical works. Either the Standard, International, or Century will answer all the demands that may be made upon it. For one who cannot afford such expensive works, a smaller edition of Webster, costing a dollar or so will be very valuable.

Aim of Era Course.

We have received a number of letters from young men desiring to take the Era Course in Pharmacy, who ask whether, after completion of the prescribed list of studies, they will be entitled to fill prescriptions and to become registered without passing the board of pharmacy examination. We answer, no; any more than does graduation from colleges of pharmacy entitle graduates to become registered without passing the boards of pharmacy examinations in a large number of the States. We are sure, however, that students who complete this course, who have pursued it faithfully and intelligently and who shall have convinced their instructors of their proficiency, need have no fear of not passing the board of pharmacy examination. The true idea of education in pharmacy does not end simply in equipping one to pass an examination required by a board of pharmacy. The methods employed must have a higher aim, and that is to prepare the student for his work beyond his mere entrance into his calling. It is on this plane the Era Course will be conducted, and it may be repeated if the student follows his studies upon these lines he will be well equipped to pass the board of pharmacy examination, and, better still, the duties of his future calling will have to direct them an intelligent and wholesome fund of knowledge.

"This is truly a very commendable movement on the part of your enterprising journal."—J. E. Bell Pharmacy, A. C. Stuckney, manager, Chicago, Ill.

"In taking this course I am prompted merely by the desire to 'brush up,' as it were. I have been a Ph. G. since 1884, but, on the principle that we are never too old to learn, and that one is never so wise that he cannot learn more, I am desirous of taking this course. I shall not be in it as a competitor for honors. I merely do this for review, and do not contemplate being able to give it that attention that it deserves at the hands of a student who particularly needs such a course."—Pharmacist, Memphis, Tenn.

EMPIRICISM.*

By JOHN URI LLOYD.

When yet young the writer of this paper sought advice concerning some business problems. The gentleman consulted, Mr. Charles Reakirt, an old druggist and a man of concerns, prominent in the business life of Cincinnati, listened patiently, and then in substance remarked: "Plan as you may, things will not go in the track you map. It is well enough to work with an object, but it is a mistake to force things if events show your views to be erroneous or prove that your labor will be lost. Take advantage of the conditions about you, do not get out of patience with others in case they do not see problems as you see them, and do not neglect a chance to work in a field that is not exactly adapted to your taste because of the fact that you cannot occupy the position you desire to reach. You may plan to do one thing, but may often be forced to do the opposite. You may imagine that you see an opportunity in one direction and will make a failure in that direction, then reverse your pre-planned course and success follows. Look for many disappointments in whatever you plan, and for success in directions you can not foresee. Be patient, be prudent, be industrious, attend strictly to business according to true business methods, and let the future take care of itself."

The subject which led me to consult the experienced old man proved to be a failure, but the lesson he gave was retained. I have since questioned more than once as to whether he did not foresee that end, and, fearing to discourage one so young and hopeful as I was then, prepared my mind for that disappointment by encouraging me to persevere in other lines after the one I had planned to take had run its course.

Be this as it may, my study of men and events has since impressed me with the fact that life's track is thickly spread with the skeletons of carefully planned schemes and foreseen successes, which unperceived conditions have swept into their final resting places.

In no place do we find this helplessness of man in the face of nature better depicted than in that of medicine. In no other field so close to science does science stand aside while chance stalks on and on, scattering to the winds the foresight of scholars and of those who hope to calculate by rule.

Regardless of the eulogistic opinions of those who, wrapped in optimistic or egotistical mantles, hold aloft the phantom banner, on which is inscribed, "The Science of Medicine," do I believe that there is no true science of medicine unless it be that chance and empiricism dominate the progress of medicine.

Empiricism precedes science. It is no discredit to a man to say that by empirical methods he is contributing to the evolution of science. So, in whatever field the lot of the physician is cast, his work is creditable, if it adds a fact now and then for the use of him who, in a time to come, will formulate order out of the collection.

Empiricism rules medicine of to-day with an iron hand; chance leads with irresistible force, and in the clutches of these two mighty agencies the earnest men who work and think and cry aloud in their hearts and in their souls for a law that will turn disorder into method, that will create a science out of chaos, are helpless. There are several sections in medicine, all alike struggling to excel, none are perfect.

It matters little whether I speak to him who cries: "*We* are the people," or to him who cries: "We *are* the people," or yet to him who says: "We are *the* people;" 'tis but the change of the accent of a word. No man is crying the truth when he cries aloud: "*We* have the *science* of medicine." Until the leaders of his peculiar section evidence that fact by laws that agree one with another, and that their followers can grasp by methods common to true science, his science (?) in the eyes of men of science, is empircism.

Empiricism governed medicine to the days of our fathers; empiricism governed medicine through the days of our fathers, empiricism governs medicine also in our own day, and he who does not acknowledge this fact flatters himself. This is a bare assertion, but is argument necessary to convince him who thinks and observes? Together we of the medical profession and the pharmacal art are treading our way, and sorting the chaff from the grain. We turn from the aboriginee to the man of science. We take from one and from the other; we adopt the good, reject the bad, and pass along. And in this movement of cultivated men struggling for materials and experiences by which to formulate rules and laws by means of which medicine can some day be formulated into an exact science, the aboriginee stands conspicuous as the friend that has done the most in helpful original experimentation for the unborn science of medicine. Surely the most in the past, possibly he is doing the most in the present.

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*Portion of a paper read before the Ohio Eclectic Medical Society.

Take from medicine those substances introduced to the profession by the aborigines, and those that the profession stumbled over by chance, and "the science" would be irretrievably crippled. Leave in medicine only the remedies introduced by scientific calculation as to their therapeutic value, and the shelves of the apothecary will be depleted.

Begin the list of remedies introduced from outside with ipecac, the gift of Eastern South America, continue with cinchona from Western South America, add thereto calabar from the African, pass to opium in Asia, podophyllum and a host of valuable remedies from North America, jalap from Mexico, kava from the Sandwich Islands, and then, with this start, swing around the world from continent to continent, island to island. Everywhere stands the wild man holding out his hand within which is to be found a drug that could only be established as a remedy by experimentation, empiricism.

As in chemistry we have passed from the empirical formula to the rational, and then to the graphic, so I could venture to name as stepping stones in the upstairs of medicine the primary empiricist (uneducated wild man and domestic herbalist), the rational empiricist (educated physician), but as yet no man in medicine is independent of experimentation, no physician can take the plants of our fields, yet to become drugs, and by means of law and science prejudge as to their effects on man in either health or disease. In the ranks of the rational empiricists stand observing physicians; the next step upward awaits yet the master hand of science.

These are bold words for one outside the field of medicine to use, but they are the result of careful thought, and express opinions formulated by close study of men in every section of the field of medicine. Empiricism dominates the therapy advance of every school; credit empiricism by the choicest remedies in medicine; strike them from existence and they could again only be rediscovered by empirical methods. By no means known to man can you of the medical profession, from a scientific standpoint, establish the therapeutic value of any of these drugs. Neither can you, by any means at your command, tell why they possess their peculiar qualities. Your professional work neither gives a law for the first nor the second part, and you have no rules to join the first to the second. The engineer will project his line and calculate its course with precision, the chemist will predict the future compound by law, the botanist classifies new plants that come to his hand, by scientific relationships, but the physician struggles in experimentation, ignorant of any law that will tell whether a new vegetable drug will purge or vomit.

While it is true that in some cases botanical relationships of drugs are followed by similar medicinal actions, it is no less true that were we to depend on such relationships, the most discordant results would follow. The deadly calabar bean is close to the edible bean of our garden, the harmless yellow poppy of our woods is linked to the opium poppy, the edible fruit of the mandrake is scarcely twelve inches from the vicious root that nourishes it, the kernel of the anacardium is prone again the shell whose juice blisters the skin and produces a suppurating sore by contact only. Who of those conspicuous to-day in medicine will venture by his science to affix to these drugs their physiological or therapeutical differences or qualities.

Neither can the other sciences give the physicians much assistance. True it is that many ethers have qualities that make them resemble each other, true that many iodine compounds bear a similarity in their physiological actions, true that the action of some of the synthetical products, from their chemical relationships, have been anticipated; but the most unexpected deviations from any rule are common. But exclusive of these the fact remains that, as empiricists, to-day the medical profession is following empiricism of the past.

But this fact, in case I am right, should not prevent us from moving onward. The facing of a fact does no man an injury. The empiricist precedes the man of science, and the work of empiricism finally gives us data that enables men to formulate laws, until at last, science is born. Everywhere we find noble men studying to raise the practice of medicine from empiricism into her place among the sciences. They search nature in the laboratories of our universities, and in the backwoods. The record that is being made is not the property of any one school or ism; it is not confined to physicians who wear broadcloth, nor is it bound to those who climb the mountain or wade in the mire. Until medicine becomes a science there will be room for empiricism; until medicine is dominated by laws that predict the future, and explain the present, there can be no conscientious slur cast upon those men who strive by experimentation and observation to add their mite to the fund that in time to come will surely extricate medicine from her present position.

Conspicuous among those who have by rational experimental methods enriched the materia medica of the world, stands the section in medicine with which my life has been closely affiliated. The world has profited by our experimentation; the American materia medica has been more largely developed by us than by others. Empiricists in the sense that we believe in careful investigation, we have labored more than half a century, and still observing, experimenting, studying the actions of drugs, we go on in the good work. Be it said to our credit, that we are not ashamed of the word experiment; the term empiricist has for us no terror.

(Special Correspondence.)

London Doings.

London, July 16, 1897.

Now that the jubilee rejoicings are an event of the past, business has settled down to some extent, and it is hoped that the improvement will last, for both wholesale and retail druggists have had a very quiet time during the last two months, and trade generally throughout the country has been slow.

The Drug Auctions

of last week were particularly heavy, and there was a plentiful supply of aloes, senna and rhubarb offered, but the prices obtained were a shade easier. Cardamoms of good quality and Dragon's Blood fetched better prices, and although the asafœtida on show was of fair quality, yet very little changed hands, because of the high price asked for it. Dragon's Blood of good quality is inquired for, but little is forthcoming, and the poorer qualities do not make good prices. New crops of several drugs are expected to arrive this month, but the prices are not yet fixed.

Several of the English drug crops have been harvested and worked up. Belladonna and henbane have been of good quality, and the 1897 extract and juice can now be obtained.

The weather of the past few weeks has been very favorable to the remaining crops, but rain is now wanted to freshen some things up; the lavender and peppermint which I have seen have been healthy, and the growers anticipate a fair crop.

When the new British Pharmacopœia appears it is expected that the standard for

Cream of Tartar

will be raised, and manufacturers are taking time by the forelock, and are offering a product which they guarantee to contain between 99 and 100 per cent. of pure $KHC_4H_4O_6$. The present standard of 92 per cent. is an absurdly low one, and admits of the preparation and sale of an article containing several per cent. of calcium salts, which may exist either as sulphate or tartrate. Most chemists are agreed that a purer product is desirable, although a few contend that such a degree of purity is unattainable, and now that the purer product is offered at somewhat less than a proportionate price, there is no doubt it will supersede the old article.

It is astonishing how different preparations are brought before the public and boomed by advertisements, and how soon other makers of the same or a similar line of goods take them up. Many years ago pills of various sorts were boomed tremendously; then the world's attention was directed to various effervescing salines, with fanciful names; next came the time for perfumes—everything bore an advertisement for somebody's scent, and theaters were perfumed "ad lib."; next came the soap craze, and countless makes of toilet, household and other soaps were advertised, and big businesses built up by the proprietors; but now the turn for food products has come, and not least among these is

Cocoa.

The use of this as a beverage is largely on the increase, and as one particular make has been advertised most extensively recently, other makers have awakened to the necessity of reminding the British public that cocoa possesses a number of virtues which ought to be made use of. In reply to a question asked in the House of Commons, the Chancellor of the Exchequer stated that since the duty was imposed on cocoa butter last year, it had yielded £3,004, and if anything the imports had increased. Here again is a product the use of which is on the increase, and for the preparation of suet substitutes, of some of which it is a component, it finds a ready market.

The winter session being over, some of the various scientific and trade bodies are busy in the anticipation of the annual meeting, and this week the Society of Chemical Industry held its meeting at Manchester. Its president, Dr. Schunck, F. R. S., delivered a most interesting address to the members, and his personal acquaintance with Dalton and many of the leading chemical industries in Manchester enabled him to speak with authority on past events. The president for the coming year is Dr. Clowes, of Nottingham.

The British Pharmaceutical Conference meets next month at Glasgow, and its secretaries are busy arranging the social part of the proceedings.

The Attfield Testimonial

was presented to the worthy professor last week, and consisted of an album containing 1,200 autographs of his past pupils and friends, an address, and a silver tea and coffee service. The presentation was made at a garden party given by Mrs. Attfield at Watford, in the presence of a large number of distinguished guests. Dr. Attfield will be known by name to many and personally to not a few Era readers, but each of his old pupils took a delight in participating in the testimonial. For thirty-four years he occupied the chair of chemistry in the school of the Pharmaceutical Society, and on his retirement last year it was decided by his old students to attempt some means of practically expressing their personal indebtedness to him, and this presentation was the result.

The New By-Laws.

which were submitted to the Privy Council by the Pharmaceutical Society have been rejected by that august body, but the intimation is said to have been made that if one or two details are remedied then the Council will be prepared to approve the suggested improvements, so it is probable that in a few years students will have to pay the increased fees, the imposition of which has excited so much comment.

The recent celebrations of the completion of the sixty years' reign of Her Most Gracious Majesty the Queen have called forth a multitude of resumés of the Victorian era. The drug trade has much to be thankful for, a great deal to regret, and plenty to record of what has happened during the last sixty years, and pharmacy has practically been created within the same period. Before the Pharmaceutical Society was founded in 1841, druggists conducted their business in a very different style to what we are accustomed to now, and the class of business transacted by them has become entirely revolutionized. Nowhere is the change more apparent than in the country districts, where druggists of 1830 did a general business in oils and drysaltery, and in many cases kept a man to mix paints and attend to heavy goods, besides the assistants who attended to his customers' more strictly pharmaceutical wants. The assistant's dispensing work consisted of the preparation of boluses, draughts and clysters, which would frighten a modern apprentice, and the habit the doctors had of letting blood and salivating their patients would be looked upon as barbarous nowadays. Progress in pharmacy has gone hand in hand with improvement in medicine, and the dainty tabloids, sugar coated pills and elixirs of to-day are a marked contrast to the crude methods of prescribing of that time. The change in the conduct of business in the country is largely attributable to increased facility in traveling and obtaining goods. The wholesale houses of 1830-1840 would send out one or two travelers on journeys in a trap, and these gentlemen would call upon their customers perhaps once in six months; perhaps once in twelve, and the goods ordered would be dispatched by wagon or boat, and arrive at the customer's some weeks after. But to-day customers expect to see the traveler oftener, and if they mail an order for goods they expect it by return. The hours of business and wages of assistants have improved materially, and whereas, for instance, the old firm of Corbyn used to get assistants who agreed to "undertake the necessary duties and wash themselves" (i. e., get their linen washed) for £20 per annum; now the average qualified assistant expects £35 to £40 and shorter hours than his predecessors.

The shipping trade, too, has altered entirely; in fact, some of the old-fashioned indents would create a sensation now in the drug trade, for some of the business done then has ceased to exist, and what is done now is much more divided and troublesome to transact. However, the London Drug Market continues to flourish, and, although it has changed so much and few of the old merchants are now living, yet the fortunes they made were by no means small ones.

The introduction of coal tar products and aniline dyes and the progress of science have changed the aspect of the chemical market entirely within the past sixty years, but the drop in quinine within the last fifteen years has been perhaps the most noteworthy change affecting pharmacy. Although chemists endeavored to produce synthetic bodies to replace the alkaloid; yet the ones which can lay any claim to medicinal value are as dear as, and in some cases dearer, than the alkaloid itself.

A FINE RED COLOR FOR SODA WATER, SYRUPS, LEMONADES, ETC.—An anonymous correspondent of the Cesky-Lloyd (Nat. Dr.) gives the following rich ruby-red, harmless vegetable coloring matter for use in fountain drinks: Let fresh red beets wilt by keeping them in a warm room for several days. Remove the peeling, cut into thin slices (the thinner, the more easily the matter is extracted), cover with vinegar and leave in contact for twenty-four hours. The liquid is then evaporated down to one-half by boiling, and after cooling, an equal quantity of alcohol is added. Thus prepared the liquid keeps indefinitely, and imparts a beautiful color to drinks of almost all descriptions.

*ON SOME CHEMICAL CHANGES IN CRUDE DRUGS DUE TO THE METHOD OF PREPARATION.**

With respect to the processes which drugs in common use undergo before being put on the market, the author has found it convenient to divide them into four classes: (1) those which usually are not dried but possess their maximum efficacy in the fresh condition, (2) those which are dried to augment their keeping qualities and which necessarily involves a chemical reaction, (3) those in which drying, besides preserving, either causes the presence or increases the amount of active ingredients, and (4) those which are subjected to further manipulations in order to give them a valuable place in the materia medica.

In America perhaps more than in Europe it will be found that but few drugs properly belong to the first class; by far the greater majority are dried. This drying process, however, is not purely the physical change of loss of water to shield the drug from the deteriorating influences of lower organisms. On the contrary, it will be seen that an actual chemical change has always been induced, generally influencing minor and unimportant constituents, yet in many cases the chief active principles themselves, the process being sometimes even carried on to actual synthesis. The great importance of the science of pharmaceutical chemistry can thus readily be inferred, for its knowledge will direct the intelligent pharmacist toward the proper methods to be pursued and will also disclose many false customs hitherto in vogue. Unluckily much in this interesting subject is still in darkness and the purpose of this article will be to review a few facts in hopes of stimulating further study.

In examining the minor chemical changes occurring as above indicated in the desiccation process we will see that the chief one, no matter whether the plant product finds medicinal, chemical or technical use, is the change of color. Plants containing chlorophyl will turn brown; barks, roots, rhizomes and resins exhibit a deeper hue; flowers will lose their warm, brilliant colors, becoming dull and dark. Such changes are the results of the action of the plant acids, of light and oxygen and it is evident that the natural colors can to some extent be preserved by rapid drying with exclusion of light. As further examples might be mentioned the increased hardness observed in certain medicinal barks, roots and woods due to an infiltration of resin or the change of esters into acids in such drugs rich in esters. But little can here be suggested as improvement. In such drugs, drying, as a rule, is a necessity to prevent decomposition.

If we go over to the major chemical changes it will be noticed that they may be desired because a superior product is thus produced. On the other hand, however, an injurious effect might be wrought, and a radical cure then would be to abstain entirely from drying the drug. It is in this case hardly proper to call these products drugs, for the word drug, derived from the Low Dutch, "drog" (dry), would be improperly applied to something fresh, though common usage certainly acts with more propriety than etymology.

The products belonging to this first class are not very numerous. Herba cochleariæ, still employed on the continent, must be used in as recent a state as possible in making spiritus cochleariæ. This plant contains a ferment similar to the myrosin of the mustard seed. Like this, it induces a change in other ingredients, producing oil of mustard in presence of water. It differs, however, from mustard in not retaining the ferment in a dry condition, so that a product from the dry drug is entirely devoid of smell and action. Similarly the expressed pulp of bitter almonds, if heated for some time to 60° of 70° C., will lose part of its amygdalin and thus increase the output of benzaldehyde and prussic acid produced by the agency of water. The action of heat on the ptyalin and pepsin of the human body indicates the delicate structure of the animal ferments. The vegetable ferments rarely possess stronger resisting powers, and drugs containing them must be carefully treated.

In the manufacture of extractum filicis, only fresh material is used. It is a well-known fact that the anthelmintic action is attributed in part to the filicico-tannic acid found in malefern. Oxidation will change this to a phlobaphen called filix-red; probably also the natural acid which forms with time causes a hydrolysis in the filicico-tannic acid, producing filix-red and an uncrystallizable sugar, so that the process of drying and storing greatly decreases the amount of one of the active constituents.

A case where drying actually causes disappearance of a valuable ingredient is observed in gentian root. Here gentianose, a carbohydrate, is entirely destroyed, and at the same time the glucosid gentiopicrin is converted into an uncrystallizable modification.

In the second class it will be noticed that these drugs may be dried, not because chemical action does not take place within them, but because it only affects them slightly or only those bodies upon whose action the action of the drug does not depend, so that they will but slightly lose in efficacy. Examples are here numerous and the reaction is often the same, namely, the oxidation of tannic acid to phlobaphens. Almost all barks exhibit this property, and to it we ascribe the acquirement of color in such drugs as corticum cinchonæ, cinnamomi, frangulæ, etc. The color of the old cinchona bark thus marks the age. In frangula a second action takes place, in that the frangulin increases in amount in drying and storing. It is probable that this is formed directly from an oxidation product of the tannic acid. Not only, however, do barks show the formation of phlobaphens. We see it also in kola, catechu, kino, etc. Cloves are brilliant red, but in drying they become darker. Pepper and mace give evidence of the same change in color, the latter losing its glossy appearance, and radix tormentillæ produces tormentilla red. Probably other changes take place in these drugs besides the formation of phlobaphens. Another striking example is the juice of fructus rhamni cathartici. When fresh this is green, acid, of disagreeable taste, producing a yellow color with alkalies, red with acids, and green with ferric chlorid. The aged juice is dark brown and turns yellowish green with alkalies and brownish green with ferric chlorid.

Certain other changes beside the formation of phlobaphens are noticed in drugs of this class in drying over fire. This is especially the case in those containing starch, or inulin, as salep, inula, curcuma, and sarsaparilla, where a hardening throughout is caused by the formation of new compounds.

We now come to the third class, in which drying actually gives us a superior product. A common example is tea. In commerce the two most common varieties are black and green tea, both being made from the same leaves, which in the fresh state are almost valueless, but by subsequent treatment become converted into either the black or green variety. The process for making black tea consists in letting it undergo fermentation and then drying it; both manipulations will develop the peculiarly fragrant aroma, the ethereal oil and the amount of xanthin compounds, while the tannic acid will be partially converted into phlobaphens. In green tea, fermentation is allowed to act only partially. The tea is then subjected to the influence of steam and rolled in pans of different temperatures so that with less oxidation a higher percentage of tannin is left and also some of the chlorophyl preserved, although much of the color is artificially produced by means of indigo and Prussian blue. It is probable that the fermenting process has a reducing action, the drying process, however, acting as oxidizer, and that thus the caffeine, theobromine, etc., are developed.

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* Abstract by Journal of Pharmacology of a paper by Carl Dieterich in Berichte d. deutsch. chem. Gesellschaft. (W. Dr.)

Other drugs containing caffeine also become more active when dried; such are coffee and kola, despite the fact that the latter is strongly recommended in the fresh condition.

Another well-known fact is that some leaves and other drugs containing essential oils will not lose these in drying as would naturally be inferred, but actually increase the amount through chemical combination, so that the characteristic smell or taste of the drug is developed only after a lapse of time. Thus aconite tubers will lose their radish-like smell to make place for a stronger, more pungent odor, indicating the existence of volatile bodies. Digitalis, and in fact all narcotic herbs, possess a disgusting odor when fresh, which they lose for a more pleasant one when dry. But we are here encroaching on a subject in which all is darkness, and which as yet awaits the ambitious investigator. To mention some more members of this interesting class we come to tobacco, where there is an actual formation of alkaloid during drying. Fennel contains more oil when stored for some time, and conium does not develop its mouse-like odor when treated with lye when fresh. Iris is of a disagreeable smell in a recent state, but when old resembles violets. Figs change their starch into glucose on aging, and so become valuable. The whole class of resins must not be forgotten, for their chemical changes are exceedingly complex and various. The presence of benzol, benzaldehyde, benzoic acid and styrol in benzoin, of styrol and its oxidation product and cinnamic acid in storax, must be directly attributed to the process of drying, for they are entirely absent or present only in small amounts in the recent products. We may further cite the appearance of ferulic acid in asafœtida, of umbelliferon in galbanum, of dammarolic acid in damar and of trachylolic acid in copal, so that there are but few true resins left that do not assert their right to belong to this class.

A fermentation process which results in the removal of the bitter taste is exemplified in cacao. Here also a reduction takes place, to be followed by oxidation, though the true nature of the reaction is not well understood. Another beautiful example in which chemistry plays a part is in both kinds of pepper. Black pepper has already been mentioned in discussing the formation of phlobaphens, but it does not contain as much piperin as the white variety, which when well dried will yield as much as nine per cent. so that its conversion into heliotropin (synthetic piperonal) by oxidation with permanganate of potassium is found profitable. The synthesis even occurs in nature in varieties of vanilla from Brazil, though the presence of piperonal is disputed.

A final subclass is the great variety of dye-stuffs of commerce. For the first time the formation of phlobaphens occurs to our profit, augmenting the output of the dyeing principles which make these drugs of such technical importance. On the other hand, we also discover certain reactions peculiar to this class, involving the so-called chromogens or color generators, so that a distinction must be made between these drugs and such products as cinchona, tormentilla, etc. Pernambuco will give brasilin through the oxidation of its chromogen; hematoxylon converts its colorless hematoxylin into hematein; in sandal wood, however, the real process that is going on is the oxidation of santalinic acid; the true chromogen santol is only colored by dissolving it in alkalies.

We may now take up the last class, which is well represented by vanilla, indigo, litmus, orchil, turnesol, and persico, and which exhibits perhaps the most complex and interesting chemical changes of all. Vanilla when fresh possesses no vanillin whatever, for this is later developed by the so-called curing, which involves virtually only a fermentive and drying action resulting in the formation of 2½ per cent. of this odoriferous principle. It is probable that the substance is formed in the plant according to reactions similar to those of the chemist in producing the synthetic article, although nature's laboratory here proves its superiority, the presence of vanillic acid as side product being unavoidable to the manufacturer.

Of great importance are the dyes mentioned; these also do not occur as such in plants, but their production is a direct result of fermentive changes wrought by man. Litmus is thus obtained from roccella tinctoria or fuciformis, lecanora tartarea, etc., by an alkaline fermentation which varies, however, according to whether litmus, orchil or persico is the desideratum. All these lichens possess a series of chromogens devoid of nitrogen. It is only by the action of ammonia that this element is taken up and nitrogenous pigments are obtained. I might mention as example the erythrinic acid present in so many lichens. Its nitrogenous equivalent is the red coloring matter of orchil. On boiling with alkalies this is decomposed into erythrite, orsellinic and carbonic acids, and orcin, the latter again reacting with ammonia to form orcein. Similarly the lecanoric acid of lichens turns red with ammonia in contact with air, and changes into orsellinic acid through the agency of other alkalies. This then yields orcin and carbonic acid as above.

In analyzing the chemical changes which take place in the fermentation of the above lichens, it is interesting to note that besides the oxidation and reduction caused by the evolution of oxygen and hydrogen in the decomposition of water, a part of the carbon of the molecule is oxidized to carbonic acid.

A discussion of this class of drugs would be incomplete without a few words concerning indigo, although the process of change in its essentials is the same as that occurring in the lichens. The chromogen is indigo-white, and this, together with small amounts of indigo-blue already formed but reduced by the hydrogen of the decomposed water, is turned into the valuable commercial variety by the oxidizing influence of the atmosphere. In comparing this process with the synthetic processes of the laboratory, as invented by Bayer and others, we see that the former is much the simpler, the latter depending on the formation of sodium orthonitrophenyl propiolate, which finally is reduced to indigo-blue. Similarly the manufacture of indigo-blue from orthodinitrodiphenyl diacetylene and sulfuric acid in no way imitates nature. In Heumann's method, however, we have a closer approximation to the workings of the plant, since the phenylglycin and caustic soda employed yield indoxyl in alkaline solution, which is then oxidized. In Finn's synthesis we also get a simple oxidation, monobromoacetanilid and caustic soda being the starting point.

Before concluding this article, I desire to call attention to a few chemical processes, which, while in themselves devoid of any definite reaction, will show how, through proper care and manipulation, the plant can be forced to yield more of its active principle. In the well-known "mossing" process, the bark is removed from the cinchona trees; they are then surrounded with moss which causes the production of a bark richer in alkaloids than the old one. In the variety of the oak yielding cork, the removal of the hard suber influences the tree to produce a better and softer kind in its place. Although I have mentioned in this review but few of the innumerable chemical processes which occur in the botanical kingdom, and although many are yet shrouded in darkness, yet I think I am justified in inferring that oxidation is the chief factor in all. At any rate, the end-product is almost always richer in oxygen. If we consider the differences of the soil from which plants draw their nourishment, and if we consider the fact that under certain circumstances the oxidation will be carried further than under others, we need not wonder at the lack of uniformity in the same drug from different sources. Thus it is that I am convinced that the study and development of this branch of pharmacy will yield far more than theoretical results and that the analysis of fresh and dried drugs at different stages will be of great advantage in directing the proper manipulations to be employed in producing uniform and superior products.

PHARMACY.

JUNIPER-TAR COLLODION.—A mixture of 2 p. of acetone collodion and 1 p. of juniper tar, which is used for painting over psoratic eruptions.

MENTHOL FOR SEASICKNESS.—Mosel Lavallée recommends (Phar. Centh.) teaspoonful doses every half hour of the following compound: Menthol 0.1 gm., cocaine hydrochloride 0.2 gm., alcohol (abs.) 60 gm., syrup 30 gm.

BRUCIN AS REAGENT FOR NITROUS ACID.—Péchard (Rep. d. Ph.) adds to a drop of the fluid to be examined, one drop of pure hydrochloric acid (free from Cl, HNO_3) and a trace of brucine; the presence of nitrous acid or a nitrite gives a cinnabar red or bright orange coloration, sensitive 1 to 640,000. Sulfites do not influence the test.

ITROL (Silver Citrate).—This remedy, introduced last year, is especially commended by Dr. Werler of Berlin as a specific in treatment of gonorrhœa, being free from all irritating effects. The same author claims to have obtained excellent results in treatment of syphilis with this same remedy which is free from secondary effects as is often the case with the employment of mercurials.

BEDBUG REMEDY.—All crevices or cracks in the wall or furniture are sprayed with a mixture of strong vinegar (10 to 15 per cent. acetic acid solution), 100 p., ether 16 p., aqua ammonia 10 p. It is claimed that this mixture destroys the eggs as well as the bugs and prevents further emigration. Care must be taken not to spray the mixture over polished furniture or on the rear side of paintings as the polish of the former and the colors of the latter suffer accordingly.

SEPARATION OF BELLADONNA EXTRACT.—Attention has been called to the fact that solid extract of belladonna on standing separates into two layers, the upper one being fluid and the lower granular an estimation of the alkaloidal content of these two layers showed that the upper fluid layer contains one-half as much again of atropin as the lower, hence the dispenser should never omit mixing the extract well before removing a portion.

SIMPLE METHOD TO PREPARE HÆMATOGEN.—According to G. B. Schmidt (Farm. Weekblad) fresh blood is shaken with 1-3 of its volume of ether in a well-stoppered flask for some time, after which the mixture is transferred to a separating funnel where it is allowed to stand quiet for several days. The blood is then drawn off and evaporated to ¾ of its bulk at 35° C., after which 30 per cent. of glycerin and 10 per cent. of cognac are added and the product transferred to amber colored flasks, well corked and stored in a cool place.

THE BILE OF SERPENTS is found by Professor Fraser to have the power of neutralizing serpent venom, whilst ox bile has the same property in a lesser degree. This neutralizing action is manifested to a wonderful degree when the bile is injected along with the venom, and to a less extent when it is injected after the venom. In a paper treating of this subject, read by the Professor before the Royal Society of Edinburgh (Pharm. Jour.) he stated that he had separated the water-soluble part of bile from the alcohol-soluble part, and found it quite equal to the best antivenene in its immunizing effects with regard to serpent venom. These are very interesting results of the investigation upon which Professor Fraser has been engaged so long, and it is to be hoped that they may prove capable of practical application.

DETERMINATION OF ALOIN IN ALOES.—Fifty grammes of the sample are dissolved in 300 cc. of boiling water, to which a few drops of hydrochloric acid have been added; after cooling, the filtrate from the resinous precipitate is mixed with 50 cc. of 20 per cent. aqua ammonia, followed by a solution of 15 gm. of calcium chloride in 30 gm. of water. After about 15 minutes the precipitate of aloin-lime is by means of a centrifuge or by sharp pressure freed from the mother liquor and triturated with a slight excess of hydrochloric acid. The mixture of calcium chloride and aloin is dissolved in the smallest possible quantity of hot water, filtered, the filter washed with a little boiling water and the filtrate cooled over ice to facilitate crystallization. The yield varies from 15 to 30 per cent.

PERCENTAGE PROFITS IN CHEMICAL INDUSTRY OF GERMANY.—According to Prof. Wiedemann the dividends paid on capital invested, average between 1886 and 1895, as follows:

	Per cent.
Alkali and Acid Industry	7.4
Chemical technical, Photographic, Pharmaceutic Ind.	12.6
Coal Tar Color Industry	19.2
Explosives	16.5
Match Industry	7.2
Fertilizers	7.5

The alkali and acid industry shows the least variations, while that of pharmaceutic products shows the greatest. The coal tar color industry began in 1886 with 10 per. cent dividends; after five years it was 20 per cent., and since 1892 it has averaged 23.45 per cent.

THE INCONVERTIBILITY OF MERCUROUS AND MERCURIC SALTS. S. Hada. (J. Coll. Science. Imp. Univ. Japan; Jour. Soc. Chem. Ind.) establishes the following facts: All mercurous salts dissociate, in presence of water, into mercury and mercuric salts, and reciprocally, all mercuric salts combine with mercury, in presence of water, to form mercurous salts, when these are able to exist. Some, and probably all mercurous salts are oxidizable by air, in presence of water, when the temperature is much above 100° C.; but at and below that temperature, mercurous salts are not oxidizable in the air, or are oxidized so slowly that the effects of oxidization are not recognizable, owing to the effects of dissociation. Mercurous oxide is oxidizable at the ordinary temperature. It was also found that mercurous nitrate, in presence of water, is converted into mercuric nitrite and nitrate by the action of heat and light.

ARTIFICIAL SILK.—Efforts are now being made to introduce into this country the manufacture of so-called "artificial silk" by the Chardonnet process, which has already been described in these columns. Of this the Textile World says: "There is a large amount of energy and capital back of the movement, which will result, undoubtedly, in the erection of a manufacturing plant, with consequences that cannot at the present time be foretold; yet, if the statements that come to us of the good results in this line in foreign countries are to receive credence, there seems to be no insurmountable obstacles for the success of an enterprise of this kind in this country. That elegant specimens in imitation of silk can be produced from the artificial fiber has been most thoroughly demonstrated. The imitation is so close that with the unaided eye detection between the artificial and the real is impossible. The magnifying glass shows a better constructed fabric made from the artificial than from the natural fiber. The thread is smoother and the lay of the yarn is more uniform. In this respect it is superior. We find here an illustration of the competition of art and the ingenuity of man against nature. The artificial and real silk are both the result of the digestion of ligneous matter, the one effected by machinery invented by man, and the other by the organs of a caterpillar."

TETRA-IODO-ETHYLENE.—This proposed substitute for iodoform is prepared as follows: 50 gm. of iodine are dissolved in a concentrated aqueous solution of 25 gm. of potassium iodide contained in a heavy beaker, this solution is cooled to 0° C., then coarsely powdered calcium carbide is added in small portions, while the solution is being stirred (a mechanical stirrer is recommended.) The formation of di-iodo-acetylene, which is also produced, is at once noticeable from its penetrating and irritating vapors, the reaction being:

$CaC_2 + 4I = C_2I_2 + CaI_2$,

$CaC_2 + 6I = C_2I_4 + CaI_2$.

The crude product contains both di-iodo-acetylene and tetra-iodo ethylene, the former crystallizing in colorless soluble needles, while the latter forms inodorous non-volatile crystals which fuse at 187° C. Di-iodo-acetylene is destructive to all forms of micro-organisms, hence hinders putrefaction, because of its odor it cannot be employed to any extent therapeutically. The tetra-iodo-ethylene is equal to iodoform in every respect, possessing the advantage of being entirely inodorous.

THE PRESERVATION OF ETHER.—The loss caused by the evaporation of ether from unsealed containers during hot weather, and in shops that are kept very warm in winter, amounts to quite a neat little sum in the course of a year. It can be prevented by the following ingenious contrivance (Nat. Dr.): Fill your container nearly full of ether, and then pour in sufficient glycerin to bring the surface of the ether nearly to the bottom of the stopper. Insert the latter carefully, and with a piece of twine of sufficient length suspend the bottle neck downward, from a nail or other support, letting the cord pass over the stopper and take a turn around the body of the bottle from each side, so that it will hang perpendicularly and safely. The glycerin, being heaviest, falls down and fills the neck of the bottle, sealing the latter hermetically. When required for use the bottle needs only to be inverted again, and the glycerin dropping to the bottom allows the ether to be poured out, if care be used, almost to the last drop. Of course the neck should be carefully wiped before pouring.

SALICYLIC ACID IN RASPBERRY-VINEGAR AND GINGER-WINE.—At Liverpool police court on May 5, David Cohen, a shopkeeper, was charged with selling raspberry vinegar which was said to contain 79 gr. of salicylic acid to the gallon, and ginger-wine, said to contain 88 gr. of salicylic acid to the gallon. Mr. Collingwood Williams, county analyst, gave it as his opinion that the quantity of salicylic acid in the drinks would be likely to affect the digestive organs, particularly in the case of children. From four to eight grains per gallon would have been all that was necessary. He attributed the presence of so large a quantity to carelessness on the part of the manufacturers. Dr. Manby gave corroborative evidence. For the defence, Mr. A. G. Steel contended that there was nothing in the mixture in any way injurious to health, and in support of this plea called Drs. Steeves and Mulliner, both of whom agreed that the quantity of salicylic acid found by the analyst was in no way inimical to health, in fact, Dr. Steeves considered that in this rheumatic climate it would be of advantage to those who drank . Mr. Davies, analytical chemist, also gave similar evidence. Mr. Stewart dismissed the case. (Ch. & Dr.) The reader can decide for himself regarding the harmfulness or innocuousness of salicylic acid as a preservative.

PHOSPHORESCENCE OF OZONE.—M. Marius Otto has just discovered an experimental fact, says La Nature (Sci. Amer.), that was described recently in his name before the Academy of Science by M. Friedel, and that may be productive of important results. This fact relates to the phenomena of luminescence to which ozone gives rise in special conditions. The fact was observed for the first time during the aspiration of ozonized air by means of a water aspirator. The light took its rise at the point of contact of the water and the ozone, and the water remained luminous for five or six seconds after issuing from the aspirator, so that a flask filled with this luminous water and taken into a dark room could be followed distinctly. The experiments were made with ozonized oxygen containing 40 to 50 milligrams of ozone to the liter (about ½ grain to the quart), and made with ozonizers invented by the author. It seems that the luminosity thus produced by the contact of ozone and water is due to the presence in the latter of organic matter of animal or vegetable origin, and that most organic substances are able to produce, with ozone, phenomena of phosphorescence. This is, then, a very particular and very interesting case of low temperature combustion, and a new example of the production of cold light.

PERSULPHURIC ACID AND ITS SALTS.—By electrolysis of a solution of sulphuric acid Berthelot obtained a compound having the formula $H_2S_2O_8$, which by reaction with water readily undergoes conversion into sulphuric acid and oxygen.

$$H_2S_2O_8 + 2H_2O = 2H_2SO_4 + H_2O_2, \text{ or}$$
$$H_2S_2O_8 + H_2O = 2H_2SO_4 + O.$$

The known reactions of this compound are:

1. Evolution of oxygen when heated.
2. Decoloration of indigo solution.
3. Elimination of chlorine from hydrochloric acid or sodium chloride.

Among the salts of this acid the most important is ammonium persulphate $(NH_4)_2S_2O_8$. It is crystalline, soluble in two parts water, and is permanent at 100° C., but in the moist state is easily decomposed, yielding strongly ozonized oxygen. The salt can be prepared by electrolysis of a solution of ammonium sulphate. It gives the same reactions as the free acid, and when warmed with a solution of aniline sulphate it gives aniline black. A solution of fuchsine mixed with sodium acetate is bleached on addition of ammonium persulphate, and with a solution of manganese sulphate manganese peroxide is precipitated.

$$\left.\begin{matrix} MnSO_4 \\ (NH_4)_2S_2O_8 \\ 2H_2O \end{matrix}\right\} = \left\{\begin{matrix} MnO_2 \\ H_2SO_4 \\ 2(NH_4)_2SO_4 \end{matrix}\right.$$

The ammonium salt can be used as an oxidizing agent in alkaline, neutral or acid solutions. The potassium salt is very sparingly soluble, and on adding potassium carbonate to a solution of the ammonium salt it is precipitated in a crystalline state. The reactions are represented by the following equations:

$$3H_2S_2O_8 + 3H_2O = 6H_2SO_4 + O_3$$
$$H_2S_2O_8 + H_2O = 2H_2SO_4 + O$$
$$H_2S_2O_8 + 2HCl = 2H_2SO_4 + Cl_2$$

Brunner has further studied this compound and its salts, and finds that when a warm solution of a persulphate is mixed with oxalic, tartaric, citric, or fat acid, or the corresponding salts, immediate oxidation takes place with evolution of carbonic acid gas. A similar action is exercised on the alcohols, which are converted first into aldehydes and then into acids. Even resistant substances such as urea or caffeine are converted in a few seconds into carbonic acid and nitrogen, and these reactions may be applied for the purposes of quantitative analysis. Quinoline and pyridine are perfectly oxidized, but grape sugar only partially. Benzene, phenol, resorcin, benzoic and salicylic acids are colored brown under the influence of persulphate salts, and yield intermediate products or are resinified or carbonized. Uric acid in presence of hydrochloric acid is not completely decomposed, but probably yields alloxan. Salicylic acid yields a yellow product (chloranil?). Nitrate of silver solution yields, with excess of persulphate, coated with compound. Bromides and iodides are at once decomposed with evolution of bromine or iodine, and the persulphates may be used for subjecting compounds to the action of nascent bromine or iodine. The easy production of ozone by the persulphates furnishes some probability that these salts may be of use in medicine, and it is suggested that since uric acid is so readily acted upon, a lithium persulphate may be usefully applied in the treatment of gout and rheumatism. (Schweiz. Wochensch., Ph. Jr.)

QUESTION BOX

The object of this department is to furnish our subscribers with reliable and tried formulas and to discuss questions relating to practical pharmacy, prescription work, dispensing difficulties, etc.

Requests for information are not acknowledged by mail and ANONYMOUS COMMUNICATIONS RECEIVE NO ATTENTION.

Information Wanted.

(T. G.) wants information concerning "Flower Mago." What is it and what are its uses?

Liquor Carbonis Detergens.

(H. L. S.) See this journal, April 15, 1897, page 453.

Mistura Thielemanni.

(Me.) A formula practically identical with the "Mistura Thielemanni" of the Swedish Pharmacopœia may be found under the title of Thielmann's Diarrhœa Mixture in the National Formulary, revised edition, page 98.

Manufacturers of Rubber Goods.

(C. F. S.) You should experience no difficulty in getting rubber goods made to order. Address the Butler Hard Rubber Company, 31 Mercer street, this city; also the Goodyear Vulcanite Company, 353 Broadway, New York.

To Prevent the Caking of Table Salt.

(Me.) It is claimed that by adding to salt glycerin, or a mixture of glycerin and cottonseed oil, in the proportion of 10 ounces of glycerin to 125 pounds of salt, or 2 to 3 ounces of glycerin and 2 to 3 ounces of cottonseed oil, the caking of table salt is entirely prevented. The addition of finely powdered starch is also recommended.

Destroying Ants.

(C. D. S.) See method of the late Dr. C. V. Riley, this journal, July 22, 1897, page 111. To successfully cope with this pest the "exterminator," whatever it may be must be introduced into their nests. Various methods and formulas for preparations for destroying ants have been published from time to time in the Era. Consult indexes.

Bottles Made to Order.

(C. F. S.) Most all bottle manufacturers undertake the manufacture of bottles of special design upon order. A factory located near your own State (Iowa) is that of the Illinois Glass Company, Alton, Ill. Manufacturers making a specialty of druggists' bottles and glassware are Whitall, Tatum & Co., Philadelphia and New York; Swindell Bros., of Baltimore, and Tibby Bros., of Pittsburg.

Change in Color of Elixir Iron, Quinine and Strychnine.

(C. M.) We know of no practical method by which the dark color may be removed from elixir iron, quinine and strychnine. This darkening in color is not always due to the tannin in the alcohol as you infer, but it is due principally to the action of light. Any elixir containing iron in the form of phosphate or pyrophosphate will invariably darken upon exposure to light. A very permanent elixir as regards color, etc., is furnished by the National Formulary (revised edition), elixir iron, quinine and strychnine. In this preparation the iron is present as a citro-chloride.

Tr. Macrotides.

(J. G. B.) asks what is meant by the second ingredient in the following prescription:

Fluid extract ergot,
Tr. macrotides,
Aletris cordial.

The quantities required in the above prescription are not stated. We know of no special preparation under the title "Tr. Macrotides." It may be that tincture of cimicifuga is wanted, one of the older botanical names for cimicifuga being Macrotys actæoides (Rafinesque). A common name applied by Eclectic practitioners to the resinoid cimicifugin, (prepared by precipitating a concentrated tincture of cimicifuga with water) is "macrotyn."

Transferring Newspaper Pictures.

(W. A. H.) Several processes were published in this journal, Oct. 15, 1896, page 502. Here is a formula along the lines you indicate: Prepare a liquid by dissolving 7½ drachms common yellow soap in 1 pint of hot water, adding, when nearly cold, 3¼ fl. ounces spirits turpentine, and shaking thoroughly together. This fluid is applied liberally to the surface of the printed matter with a soft brush or sponge (being careful not to smear the ink which soon becomes softened) and allowed to soak for a few minutes; then well damp the plain paper on which the transfer is to be made, place it upon the engraving and subject the whole to moderate pressure for about one minute. On separating them a reversed transfer will be found on the paper.

London Purple

(H. L. S.) London purple is chiefly arsenite of calcium, a residue obtained in the manufacture of aniline dyes. It does not contain quite so much arsenic as Paris green, and, being a by-product, it is not constant in its constitution. According to an analysis made some years since by Dr. P. C. Collier, chemist of the United States Department of Agriculture, its composition is:

	Per cent.
Rosanilin	12.46
Arsenous oxide	43.65
Lime	21.82
Insoluble residue	14.57
Water	2.27
Loss	4.47

A later analysis of a sample of London purple is the following, reported by the chemist of the Vermont Agricultural Experiment Station:

Moisture at 100° C.	3.37
Arsenic (arsenous oxide)	46.73
Lime	24.35
Iron and alumina	1.31
Sulphuric acid	0.46
Nitrogen	1.65

Hair Curling Preparation.

(C. I. B.) The following is a typical formula:

Powdered gum tragacanth	2 ounces
Borax	½ dram
Powdered soap bark	20 grains
Oil rose geranium	½ dram
Oil rose	3 drops
Oil cinnamon	4 drops
Oil bitter almonds	2 drops

Extract musk, enough.

This preparation is not used dry upon the hair, but may be kept on hand to prepare a "liquid curler" with water, as needed. About a dram of the powder to 8 ounces of water will produce a satisfactory preparation.

A formula for a "liquid curler" or bandoline is this one from the Era Formulary:

Gum tragacanth	8 ounces
Rose water	6 pints
Orange flower water	2 pints
Salicylic acid	16 grains
Alcohol	2 drams
Oil of rose	1 dram
Extract of musk	5 drops
Oil of wintergreen	5 drops

Shade a delicate pink with carmine solution.

Let the tragacanth stand 24 hours in the water, and strain through muslin; add the salicylic acid dissolved in the alcohol, and the remaining perfumes with thorough admixture. For a number of other formulas see this journal, March 18, 1897, page 333.

Black Ink.

(C. F. S.) There are formulas and formulas for ink, but they are not all adapted for special purposes. We select several from our files among which you may find some one suitable:

(1) Sulphate of iron	1 ounce
Logwood	1 ounce
Gall nuts	3½ ounces
Gum arabic	1 ounce

Pulverize each separately, mix, and add:

White wine vinegar (or acetic acid)	1 quart
(2) Pulverized gall nuts	100 parts
Sulphate of iron	250 parts
Gum arabic	200 parts
Water	6000 parts
Creosote, a few drops.	
(3) Extract logwood	15 parts
Carbonate of sodium, crystallized	4 parts
Neutral chromate potassium	1 part
Water	1000 parts

Dissolve the extract in 900 parts of the water, allow it to deposit, decant, heat to boiling, and add the carbonate of sodium; lastly, dissolve the chromate of potassium in the remainder of the water, and add to the logwood solution drop by drop with constant stirring.

Under the title of "school board ink" "Chemical Recipes," an English publication gives this formula:

Naphthol black	2 ounces
Oxalic acid	¼ ounce
Water	1 gallon

Mixes best in cold water. The oxalic acid may be omitted if desired. This ink is said to be a very good article for cheap trade.

A black ink may also be easily prepared by dissolving a suitable amount of black aniline, or atramine in water. The solution, however, should not be of such a concentration that the writing when dry shows a metallic luster. To give the ink the required body add a small quantity of mucilage of gum arabic. For copying purposes add a small quantity of glycerin.

Compound Elixir of Kola.

(Mc.)

(1) Fluid extract of kola	1 fl. ounce
Fluid extract of erythroxylon	1 fl. ounce
Fluid extract of celery root	1 fl. ounce
Alcohol	2 fl. ounces
Aromatic elixir, enough to make	16 fl. ounces

Mix the alcohol with 4 fluid ounces of aromatic elixir. To this add the fluid extract of celery root in several portions, shaking after each addition, and afterwards the other fluid extracts. Finally add enough aromatic elixir to make 16 fluid ounces; allow the mixture to stand 24 hours and filter.

(2) Fluid extract of kola	1 fl. ounce
Fluid extract of coca	1½ fl. ounces
Fluid extract of celery seed	1 fl. ounce
Tinct. of sweet orange peel, U. S. P.	½ fl. ounce
Oil of orange	2 fl. drams
Oil of cinnamon	8 drops
Oil of cloves	8 drops
Caramel, enough to color,	
Alcohol,	
Diluted alcohol, of each enough to make	16 fl. ounces
Purified talcum	1 ounce

Dissolve the oils in 4 fluid ounces of alcohol, triturate this solution, the fluid extracts, and the tincture intimately with the purified talcum, add then the caramel and enough diluted alcohol to make a pint, transfer the whole to a filter, and pass, if necessary, enough diluted alcohol through the filter to make the filtrate measure 16 fluid ounces.

Red Ink.

(C. F. S.) Here are several formulas:

(1) Carmine, No. 40	30 grains
Ammonia water	1 dram
Acacia	6 grains
Water, q. s. to	1 ounce

Dissolve the carmine in the ammonia, and add the other ingredients. The depth of tint may be varied by the use of more or less water.

(2) Half a dram of powdered drop lake and 18 grains powdered gum arabic, dissolved in 3 ounces ammonia water, makes one of the finest of carmine inks.

(3) The Era Formulary is authority for this one: Rub 6 parts of red carmine with 75 parts of liquid water glass. Dilute this mixture with 675 parts rain water. Let it stand a few days, and pour off the fluid.

Scarlet Ink for Steel Pens.

(4) Aniline crimson	1 ounce
Water	1 gallon

(5) Lehner's "Manufacture of Ink" gives this formula for a red fuchsine ink:

Fuchsine	2 parts
Gum arabic	5 parts
Alcohol	10 parts
Water	100 parts

Pour the alcohol, 90 per cent., over the finely rubbed fuchsine and effect complete solution by gently heating. Dissolve the gum arabic by itself in the water, strain the solution, and heat to boiling. Into the boiling solution pour the fuchsine solution in a thin jet, stirring constantly.

Barbers' Bay Rum.

(Phm. B.) The Era Formulary gives the following formula under the above title:

Oil bay	6 fl. drams
Oil pimento	1 fl. dram
Oil orange peel	1 fl. dram
Tincture orange peel, U. S. P.	½ ounce
White castile soap	4 drams
Cologne spirit	12 pints
Water	9 pints

Dissolve the castile soap in a pint of the water by the aid of heat; dissolve the oils in the cologne spirit, gradually add the solution of soap, tincture of orange and water, let stand and filter.

Here are two others:

(1) Distilled oil bay	1 fl. ounce
Ether acetic	1 fl. ounce
Oil pimento	½ ounce
Alcohol	1½ gallons
Water	1½ gallons

Add 1 ounce pure borax; this gives the desired color. First dissolve it in ½ gallon of the water, then filter.

(2) Oil of bay	½ ounce
Carbonate of magnesium	1 ounce
New England rum	1 pint
Alcohol	2 pints
Water	2 pints

Anti-Fat or Flesh Reducer.

(W. B. & Co.) A résumé of the various methods of treatment suggested and advocated in these days would require far more space than this department can spare. It is a subject for the practitioner rather than for the pharmacist. Among the best known of the different methods advocated is that called the Banting system. Its chief feature is the exclusion of the elements—fat, starch and sugar—from the food. Therefore bread (except toast, or the crust of a common loaf), potatoes, sweet roots, butter, sugar, cream, beer, porter and champagne, should be avoided. This was practically the method of Hippocrates, who avoided all fats, starches and sugars; in fact, all roots or vegetables grown underground. Similar to this system is that known as the German Banting, which consists in the eating of fat, but no sugar or starch. The Schweninger or Œrtel method uses chiefly albuminous food, excluding fat and carbohydrates, limits the fluids drank, especially at meals, and enforces exercise. The Munich system does not pay so much attention to dieting, but insists upon the wearing of wool by the patient, and sleeping in flannel blankets instead of sheets. Among the many remedies prescribed may be mentioned iodoform, which is said to be highly efficient, but causes wasting and anæmia by injuring the red blood corpuscles. Alkaline mineral waters, with exercise and dieting, have been found serviceable. Potassium permanganate has also been found useful in doses of ¼ to 1 grain in distilled water, three times a day. Vinegar is another remedy which has been highly indorsed. Fucus vesiculosus, or bladder wrack, has been used for years for the purpose, its value probably depending upon the amount of sodium iodide it contains. Poke root, in one form or other, is also a claimant for recognition. Another remedy recently put forward is tincture of Adonis æstivalis. Just how successfully it has been used for the reduction of corpulency is not stated. In all methods of treatment, daily exercise in the open air is necessary. This of itself, if carried on systematically and accompanied by a just discrimination as to one's dietary, would seem to be the most efficient and least injurious method of reducing an excess of adipose tissue. Corpulency is sometimes brought on by disease or other systematic disturbances, and therefore any course of treatment pursued should be under the guidance of some reputable physician.

Bead for Liquors.

(Mc.) In the liquor trade, anything added to liquors to cause them to carry a "bead" and to hang in pearly drops about the side of the glass or bottle when poured out or shaken is called "beading," the popular notion being that liquor is strong in alcohol in proportion as it "beads." The object of adding a so-called "bead oil" is to impart this quality to a low-proof liquor, so that it may appear to the eye to be of the proper strength. The following formulas for "bead oil" are given:

(1) Sweet almond oil	1 fl. ounce
Sulphuric acid, concentrated	1 fl. ounce
Sugar, lump, crushed	1 ounce
Alcohol, sufficient.	

Triturate the oil and acid very carefully, together in a glass, wedgewood or porcelain mortar, or other suitable vessel; add by degrees the sugar, continue trituration until the mixture becomes pasty, and then gradually add enough alcohol to render the whole perfectly fluid. Transfer to a quart bottle, and wash out the mortar twice or oftener with strong alcohol until about 20 fluid ounces in all of the latter has been used, the washings to be added to the mixture in the bottle. Cautiously agitate the bottle, loosely corked, until admixture appears complete, and set aside in a cool place. This quantity of "oil" is supposed to be sufficient for 100 gallons of liquor, but is more commonly used for about 80 or 85 gallons. The liquor treated with this "oil" is usually allowed to become clearer by simple repose.

(2) Soapwort, coarsely ground	13 ounces
Diluted alcohol, enough to make	1 gallon

Extract the soapwort by maceration or percolation.

This is also intended for 80 gallons of liquor, preferably adding to the latter one-half gallon of simple syrup.

The ingredients of the above formulas, according to the Manual of Beverages, are not injurious—not at least in the quantities required for "beading." It is said that beyond a certain degree of dilution of the liquor with water, these preparations fail to produce the intended effect. The addition of sugar or syrup increases their efficacy.

Luminous Paint.

(Electea) Here are a number of formulas:

For orange luminous paint, 46 parts varnish are mixed with 17.5 parts prepared barium sulphate, 1 part prepared India yellow, 1.5 parts prepared madder lake and 38 parts luminous calcium sulphide.

For yellow luminous paint, 48 parts varnish are mixed with 10 parts prepared barium sulphate, 8 parts barium chromate and 34 parts luminous calcium sulphide.

For green luminous paint, 48 parts varnish are mixed with 10 parts prepared barium sulphate, 8 parts chromic oxide green and 34 parts luminous calcium sulphide.

A blue luminous paint is prepared from 42 parts varnish, 10.2 parts prepared barium sulphate, 6.4 parts ultra-marine blue, 5.4 parts cobalt blue and 46 parts luminous calcium sulphide.

A violet luminous paint is made from 42 parts varnish, 10.2 parts prepared barium sulphate, 2.3 parts ultra-marine violet, 9 parts cobalt arsenate and 36 parts luminous calcium sulphide.

For gray luminous paint, 45 parts of varnish are mixed with 6 parts prepared barium sulphate, 6 parts prepared calcium carbonate, 0.5 parts ultra-marine blue, 6.5 parts gray zinc sulphide.

A yellowish-brown luminous paint is obtained from 48 parts varnish, 10 parts precipitated barium sulphate, 8 parts auri-pigment and 34 parts luminous calcium sulphide.

Luminous colors for artists' use are prepared by using pure East India poppy oil, in the same quantity, instead of the varnish, and taking particular pains to grind the materials as fine as possible.

For luminous oil color paints, equal quantities of pure linseed oil are used in the place of the varnish. The linseed oil must be cold pressed and thickened by heat.

All the above luminous paints can be used in the manufacture of colored papers, etc., if the varnish is altogether omitted and the dry mixtures are ground to a paste with water.

The luminous paints can also be used as wax colors for painting on glass and similar objects, by adding, instead of the varnish, 10 per cent. more of Japanese wax and one-fourth the quantity of the latter of olive oil. The wax colors prepared in this way may also be used for painting upon porcelain, and are then carefully burned without access of air. Paintings of this kind can also be treated with water glass.

Liquid Disinfectant.

(Pharmacist.) What is ordinarily meant by a disinfectant for use about the house is a deodorizing antiseptic. Copperas, on account of its cheapness, is most frequently used, and is efficient. It has one especial recommendation in its cheapness. The fault found with it is, that it produces rust stains and unsightly discolorations whereever it is used. This does not interfere with its usefulness in stables, outhouses, drains, etc., but is an objectionable feature. Salts of alumina, especially the sulphate, answer the purpose better for use about the house. but are, of course, somewhat more costly. A strong solution of chloride of zinc, prepared by dissolving scrap zinc, or zinc oxide, to saturation in muriatic acid, is of much greater intrinsic value as a disinfectant, and on the whole is probably the best thing to recommend. The only objection to it is that it is poisonous, and it should never be sold without a poison label. Among the disinfectants said to be especially useful in destroying foul odors is thymol, which may be most conveniently used in the form of an alcoholic solution, to be employed with a spray apparatus.

Here are a number of typical formulas:

Household Disinfectant.

Iron sulphate	8 ounces
Ammonium chloride	1 ounce
Corrosive sublimate	1 dram
Alcohol	4 ounces
Water, to make	32 ounces

Dissolve the iron sulphate in 24 ounces of water, and the corrosive sublimate in the alcohol. Mix both solutions, add the ammonium chloride and enough water to make 32 ounces. Mix with equal parts of water, and use as a disinfectant.

Solution of Four Chlorides.

Alum	10 ounces
Sal soda	10 ounces
Sal ammoniac	2 ounces
Common salt	2 ounces
Chloride zinc	1 ounce
Muriatic acid, commercial, q. s.	
Water, quantity sufficient to make	1 gallon

Dissolve the alum in ½ gallon of boiling water, then add the sal soda, which gives a precipitate of aluminum hydrate. Muriatic acid is then added in sufficient quantity to dissolve this precipitate, thereby forming aluminum chloride. The other salts are then dissolved in the remainder of the water and added to the first solution. The advantages claimed for this preparation are cheapness, ease of preparation, odorless, non-poisonous, and its adaptability for general use. Its freedom from iron, in the disinfection of clothing, is an important point, in so much that it will not injure the fabric in any way.

Liquid Deodorant for Water Closets.

Ferric chloride	4 parts
Zinc chloride	5 parts
Aluminum chloride	5 parts
Calcium chloride	4 parts
Manganese chloride	3 parts
Water, sufficient to make	90 parts

Dissolve, and add to each gallon 10 grains thymol and ¼ ounce oil of rosemary, previously dissolved in about 6 parts of alcohol, and filter.

Disinfecting Fluid for Sick Room.

Guaiacol	50 grams
Eucalyptol	40 grams
Menthol	20 grams
Carbolic acid	30 grams
Thymol	10 grams
Oil clove	5 grams
Alcohol, q. s.	1000 grams

To be sprayed about with water.

Hair Dye.

(W. F. & S. J.) There is no hair dye which possesses very great "lasting qualities." The natural growth of the hair requires that the dye be applied frequently or rather often enough to keep the color uniform. The various shades of brown are usually produced by the application of a black dye which has been appropriately weakened or diluted. To produce an "ash blonde" or "to turn a grey moustache a brighter blonde or light golden color" requires a little experimenting which, for want of a moustache of the shade named, we have not made. However, here is a formula for a preparation which has been heartily indorsed.

(1)	Pyrogallic acid	1 dram
	Alcohol	4 drams
	Distilled water	4 fl. ounces
(2)	Silver nitrate	1 dram
	Distilled water	4 drams
	Water of ammonia, enough.	

After dissolving the silver nitrate in the water, gradually add water of ammonia, stirring constantly, until the brown turbidity produced has disappeared and the solution appears colorless. Then add

Distilled water, to make .... 1 ounce

A large excess of ammonia tends to produce a brownish dye. Various shades of brown may be produced by increasing or decreasing the amount of water in the silver solution. Previous to applying the dye the hair should be freed from grease by washing with warm water containing sodium carbonate, borax or soap, well rinsed with water, and dried. To use, apply the pyrogallic acid solution with a stiff brush; when partially dry, apply the silver solution in the same manner, using another brush. For a brown dye the solution of pyrogallic acid should be made very weak (about 10 grains to 4 ounces). A "one-bottle" preparation which may be made to produce the various shades of brown is this one:

Silver nitrate	70 grains
Stronger water of ammonia	q. s.
Orange flower water	½ ounce
Glycerin	½ ounce
Distilled water, to make	4 ounces

Dissolve the silver nitrate in two ounces of water and add stronger water of ammonia until the precipitate first formed is dissolved. Then add the other ingredients. Preparations of this character should be kept in dark glass bottles.

Another one-bottle preparation is this one:

Nitrate of copper	360 grains
Nitrate of silver	7 ounces
Distilled water	60 ounces
Water of ammonia, a sufficiency.	

Dissolve the salts in the water and add the water of ammonia carefully until the precipitate is re-dissolved. This solution, properly applied, is said to produce a very black color; a lighter color is secured by diluting the solution. Copper sulphate may be used instead of the nitrate. Any number of formulas for hair dyes may be found in previous volumes of this journal. Consult the indexes.

*SALOL-COATED PILLS.**

By H. P. HAYDEN, Ph. G.

Having received several orders for five-grain salol coated quinine pills, and finding none on the market, we were forced at once to make the trial of coating them ourselves. We consulted the files of three or four journals, also the text and reference books at command, and while we found several formulas or plans suggested, none of them, upon trial, proved in any way satisfactory. Most of the processes required the solution of the salol in either alcohol or ether. One writer proposed a solution of alcohol and shellac, and this was the formula sent us by a physician who had ordered these pills. A plan advising the pills to be dipped in the melted salol and the pin hole closed up with a brush was the most absurd of all. Much experimenting was done by my colleagues and myself. We tried solutions of salol and resin of varying strengths, tried melted mixtures of salol with wax and with paraffine, as well as solutions in all the solvents for the substance. Finally, after many trials, I succeeded in getting a satisfactory coating, having a pleasing appearance, by a very simple process, yet one that must be practiced considerably before the best results can be secured.

The first important step in coating pills with salol is to make the pills hard and uniform in size. They should be perfectly round and free from dusting powders, as lycopodium, etc., prevents the salol from adhering to the pills. The requisite amount of salol is placed in an evaporating dish and gentle heat applied until the salol is liquefied. This should be allowed to cool down to about 50 degrees C. The pills are then placed in the dish containing the liquefied salol, and the dish rotated until the salol becomes cool. If the pills have not sufficient coating they should be treated again in the same way. This will be found to give them a very rough coating, which may be made perfectly smooth by transferring the roughly coated pills to an empty evaporating dish which has been heated just so that when the pills are placed in it the coating will be slightly melted. By rotating the dish while they are in this softened state, they will soon be made to present a smooth, glossy appearance. They should then be transferred to a wooden dish or pill finisher, to which they will not adhere while cooling. Pills coated in this way and attached to a silk cord have been swallowed and retained in the stomach for two hours.

ANÆSIN.—This aqueous 1 per cent. solution of aceton chloroform, which has been highly commended in the Budapest clinic, is said to be equivalent in activity to a 28 per cent. solution of cocaine and free from all danger. Used locally in eye operations and subcutaneously in surgical operations and extraction of teeth.

AN ARREST of attention is likely to occur if you glance through the advertising pages of the Era. The advertisers are working for a prize and the one who receives the most replies during July and August gets it. Watch for the good offers and mention the Era when writing so that proper credit may be given.

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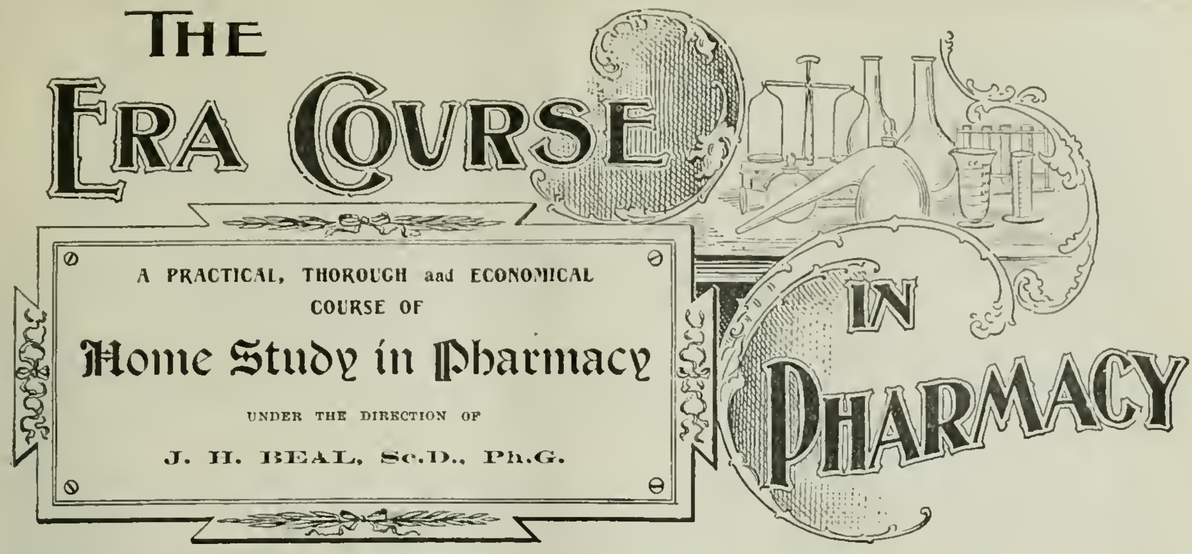
*Read at the fifteenth annual meeting of Maryland State Pharmaceutical Association.



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BOOKS FOR THE ERA COURSE !

We have received many letters from students who ask what books they must have to supplement their studies of the lectures in this course. To these we would answer, not many. By this statement we do not wish to be understood as endeavoring to discourage the student from buying as many books as he can. The possession of the standard books and works of reference belonging to one's calling usually indicates that the possessor has a profession or business in which he takes considerable pride. Collections of books and libraries should come with experience and increase in mental stature. The student must grow up to them. But at the outset he needs but few books, one, perhaps, on each subject making up the science of pharmacy. These few books will be of service to him all through his career as a pharmacist, and he will treasure them, not for the money outlay they represent, but because he knows them as sources from which he may draw information when he most needs it. In the issues of July 8 and 15 of this journal was published a very comprehensive and representative list of books on the subject of pharmacy and cognate sciences, from which the student may be able to make such selections as he desires. He need not buy all of his books at the outset, but he should have to begin with a copy of the United States Pharmacopœia, one of the dispensatories and a copy of some one of the standard works upon each of the subjects of chemistry and pharmacy. For the choice of special works in connection with the various subjects it is expected the student will have the benefit of the advice of the respective lecturers. In the language of the copy books of a generation or two ago, "Buy few books; buy good books; let those few be studied well."

Hours of Study.

The best hours to study is a question the student must decide for himself. After he has arrived at a decision, however, he should closely follow the outline he has marked out. It is a well established principle of educators that any systematic course of education should be, to secure the best and highest results, continuous, and the studies must be learned, digested and assimilated from day to day. A plan of this kind steadfastly and honestly pursued will enable the student to accomplish far more than when his study hours are subject to unnecessary interruption. Have regular hours for study and then use them for no other purpose.

Benefit of General Education.

The possession of a good general education places him who would study pharmacy at an immense advantage over his more unfortunate brother who would pursue a similar course. The pharmacy student of the present must have a broader and more thorough preliminary education than was formerly demanded. It is impossible for such training to be too thorough. First of all, he should be able to use his mother tongue correctly. It is not necessary that he should be a ready and fluent writer, but he should be able to write out in good English his knowledge of facts as he understands them. He is handicapped to just the extent he is not able to do this. A knowledge of mathematics is another essential which must be mastered. The world's verdict of success is expressed in figures and products of mathematical calculations. The student, if he would enter pharmacy as a calling leading to success, if he would compete with others who have in view the same objective point, must be equipped with the ability to comprehend and use the principles of mathematics in the daily routine of business duty.

Cultivate the Faculties of Observation.

A fondness for the study of natural science is of great advantage to one beginning the study of pharmacy. But there is an easy and a hard way to learn. The didactic lecture and theoretical study common in all branches until very recently constitute what may be called the "hard" way. This method is in operation in many of our colleges, and perhaps will never be entirely superseded, but there is a tendency toward replacing it by object teaching and experimental work, manual training appealing through the senses and faculties. Pharmacy in both its study and practice, calls into constant use the faculties of observation, memory and reason. It will be the aim of those in charge of this course to inculcate in the mind of the student the principle that instruction where the student handles and studies the substance or thing itself, is immeasurably superior to any instruction that can be possibly gained from the use of books alone. The student must learn to cultivate his powers of observation, and unless he will do this, he cannot hope to be among the winners in either his studies or the battles of life.

THE EXTRACTION OF OLIVE OIL.

The extraction of oil from the olive is a purely mechanical process. In California two general plans are followed in preparing the olive pulp for the press. One is to grind the pits of the fruit with the flesh, and the other is to grind the flesh from the pits without crushing the latter. As the result of experience and various chemical analyses, it has become quite generally understood that the pit contains little oil, and that the practice of grinding it with the flesh tends to detract from the quality of the output.

Most of the mills now used for preparing olive pulp are made of cast iron, the crushing being done by a series of rollers. The presses used for extracting olive oil are of many patterns. Some growers use powerful screw presses, while others prefer the hydraulic press. Home-made lever presses, like the oil-fashioned cider press, are still in use by some, and can be relied upon to do good work.

The olive pulp as it comes from the mill is placed in sacks for pressing. There are several styles of sacks in use, the French being made of fine fibrous grass, while those preferred in Italy and Spain are of coarser material and looser construction. The sacks are made in the form of a cheese, and are open at the center of the top and bottom for filling and cleaning. In preparing for pressing, a series of wooden slats, forming a kind of grating, is first laid on the bottom of the press. Over this is placed a perforated, circular plate of iron, on which is laid one of the grass mats or sacks. The pulp is then crowded into the sack until it is full. Upon the first sack is placed another perforated iron plate, more wooden slats, and then another sack to be filled. This is continued until six or eight sacks of pulp are placed one above the other ready for pressing. A number of California growers do not use grass sacks on account of the difficulty of keeping them thoroughly clean, but instead employ a Russian crash, cut into circular pieces about three feet in diameter. A galvanized-iron hoop, of the breadth and depth of the cheese desired, is first placed on the wooden grating. Over the top of this hoop is spread the piece of crash, and upon it is poured the olive pulp until the hoop is packed. The sides of the cloth are then turned over the pulp and the hoop is withdrawn. A slat grating is now placed on the cheese and the process repeated.

The first pressing of the olive pulp is done slowly and with caution, and the resulting oil, which is frequently known as virgin oil, is usually, on account of its superior quality, kept separate from that of the second and third pressings. When the oil ceases to flow after a thorough first pressing, the pulp is removed, left until next day, and then reground and repressed. If desired, water may be added to the second pressing, but the oil thus obtained is of inferior quality. A third crushing and pressing, with the use of hot water, may be given to obtain the little remaining oil, which is of the lowest grade.

The subsequent clarification of the oil involves two general processes, namely, its separation from the watery juice of the fruit and from fragments of tissue by means of gravity, and a special clarification by means of filtration. There are scarcely two mills in this country which use the same vessels for the separation of oil. The form of the settling tanks, as well as their size and the material of which they are made, varies widely. Tin, wood or stone vessels may be used successfully if kept perfectly clean. Tin vessels are probably most commonly employed, though some producers insist that white oak tanks are better. Whatever form or kind of vessel is chosen, the expressed olive fluids are allowed to stand in it until gravity has caused the oil to rise to the surface. As the oil rises it is either removed and placed in other similar vessels for further separation of impurities or else is stored in tanks to remain till ready to bottle.

The process of clarification by filtration, which usually follows the separation of the oil by gravity, varies. The clearest and most brilliant oil is, however, usually obtained by passing it through some compact filter, such as is used for filtering spirituous liquors, or the firm, gray filter paper commonly sold in circular sheets by druggists. A less brilliant oil may be obtained by passing it through more porous filters. It is even probable that oil bottled without filtration, if thoroughly cleared by standing at a proper temperature for a sufficiently long time, will be of a finer flavor than that passed through filters.

Cleanliness is a most essential feature in making olive oil, as this oil readily absorbs all taints and odors. No offensive smell and no tobacco or smoke of any kind should be allowed about the oil house, and everything in the building—mills, presses, cloths, dishes, tanks, etc.—should be kept scrupulously clean by washing daily with boiling water, and when possible with lye also.

In all the processes of expressing and handling olive oil it is important that it be kept at a moderate and uniform temperature and that it be not exposed to the light more than is necessary.

The gathering of olives at a proper stage of ripeness is an important feature of the olive industry. The olives should not be allowed to hang too long, but should be gathered while red. The best oil comes from olives not overripe. With late varieties there is also the advantage in early gathering that much risk from cold weather is avoided. Olives which have been frost-bitten should be sent to the mill at once. In gathering, the olives should not be allowed to remain on the ground more than a few hours, if at all, and all imperfect and bruised fruits should be culled out, as well as those which are overripe. The latter may be put through the mill by themselves and the product kept separate. The fruit should be picked at a stage of ripeness as nearly uniform as possible. After being gathered, the olives should be spread out on trays in thin layers, so that the air may circulate freely from among them, and the trays should then be kept in a dry, clean and airy room. The fruit on the tray should be turned over every two or three days for twelve or fifteen days, or until it is properly dried, after which it is ready to be reduced to pulp in the mill.—Yearbook U. S. Dept. Agriculture.)

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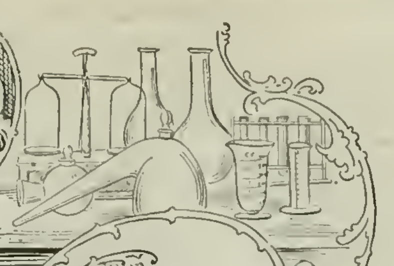

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THE CORRECT USE OF NOMENCLATURE.

It has taken years to bring our Pharmacopœial system of nomenclature to its present standard, a system which has been pronounced "brief, simple, expressive, distinctive and convenient." And this brings us to a consideration of the idea expressed in the above caption, "The Correct Use of Nomenclature." Nomenclature as here understood may be defined as a collection of terms or words peculiar to a science or art. In all sciences it is an object of importance and each term should convey to the student a definite meaning. Its study gives him the power to grasp and the exercise so necessary to learn how to generalize the vast number of facts with which he has to deal. The correct use of its terms is not a pedantic display of useless knowledge, for correct use gives rise to correct conceptions, definite forms of expression and a satisfaction of certainty which admits of no inconvenience or guesswork. The remarks made in these columns a short time ago on the use of the dictionary should be emphasized. In the prosecution of your studies of the lectures to follow we would have you carry the study of the dictionary as well. Language is the great instrument by which we have intercommunication of ideas, by which we become beneficial one to the other. It is our duty then to study it and more especially the language of what is to be our chosen calling. The master can almost always trace back his pupils' defective use of nomenclature to an indistinct conception of the subject under consideration. The study of nomenclature as applied to pharmacy, chemistry and the cognate branches, is fascinating and the student will find no richer field for investigation into the development of language, its theories, analogies, comparative philology, etc., than may be found in his examination of the terms peculiar to pharmacy. Each word, each term, has an unwritten story of the past which, as it is unraveled, opens up the glowing imagination of the primitive mind and brings to view the original conceptions and expressions of the early philosopher. The more definite conceptions of the later investigators are also brought to view and with them the true aim of education —success and usefulness in life. Lavoisier has been called the "father of modern chemistry," but he bequeathed to it no richer gift than the influence of his greatness upon its nomenclature. The Swede, Carl von Linné, raised botany to the character of an edifice resting upon a firm foundation. He did it by his system of nomenclature which was of a truly scientific character. All of the masters in science have been masters of the correct use of nomenclature. And the true student who would master the principles of any science must acquire certain intellectual habits; he must know how to use the language of science.

Written Exercises.

The successful educator places great faith in the notebook idea accompanied by written exercises and examinations. The mere act of writing out one's ideas is educational because unless the writer has clearly perceived and kept in view the nature of his subject he cannot make himself understood. The correspondence idea is a good one. It engenders the habits of observation. Its prosecution enlarges our conceptions, for, unless we learn to observe we cannot truthfully describe ideas or facts. Oral examinations and recitations are of great importance, but it is the written examination which tends to make the student precise and exact in exposition and it also serves to make his presentation of the subject something other than a servile and mechanical reproduction of what has been said in the class. It begets originality. It was said by Talleyrand that the use of language is to conceal one's meaning, and to the politician there may be something in the statement. The student, however, should endeavor to cultivate the art of putting his knowledge in language that cannot be misunderstood. The essentials to this end are correctness of expression, accuracy and fullness of detail.

The Study of Materia Medica.

To some students this subject proves, perhaps, the least interesting and most difficult of those which must be followed to obtain a desirable pharmaceutical equipment. To the young man in the store it presents some obstacles which the college student does not meet, but on the other hand there is no better place than a well-stocked drug store to become trained in certain branches and features of materia medica. He has here exceptional facilities for handling drugs and becoming acquainted with their characteristics and physical peculiarities. In the study of materia medica, however, there is a large amount of work which must be purely book work and memory work to the pharmaceutical student, for he has not the advantages that the medical student possesses to acquaint himself with the physiological and therapeutic properties of drugs. Here he must rely upon the lectures and his textbook where he will find a classification of the articles of the materia medica after a definite plan. He must familiarize himself with the terms employed to describe medical action and the names of diseases. Then following the classification he finds drugs taken up in logical order, each having its sources, physical and chemical properties, medicinal uses and effects, doses, preparations, etc., described in detail. Considerable of this description will render necessary hard study and more or less memorizing, but the student should never omit verification, so far as material at his command will permit, of every statement made. Thus, in studying the drug opium, he should compare an actual sample of it with the description, from the store he can obtain several of the principal articles produced from it and subject them to the described chemical tests, and he should see and make as many of the official preparations of the drug as possible or advisable. As a rule, he must accept as facts, statements concerning medicinal uses and effects, though in numerous instances he may verify these statements. By following such a system of study as this, a combination of the practical with the theoretical, of verification of the printed statement by experimentation and tests, he will quickly become possessed of an amount of information, in regularly arranged form, easy of application, quick of recollection, which will constitute a thorough working knowledge necessary to his calling.

How to Study.

First of all, have regular hours of study. A few minutes bestowed regularly each day will be of greater benefit than hours of irregular and desultory reading. To thoroughly master the subject matter of a lecture will require about three perusals; first, an easy reading to discover the general scope and arrangement of the subjects treated of, then a very careful study to discover thoroughly the teaching of each paragraph, and, finally, another general review to classify the whole and bring out the connections and relations of its various parts.

After the substance of the lecture has been mastered, the student may profitably bestow any remaining time upon the reference texts which accompany the lectures. It is well, however, to defer this reference until after the lecture has received its full consideration. The objection to the reading up of references before the lecture has been mastered lies in the temptation to desultory and careless reading, to the neglect of general principles.

As each recitation blank is received the questions should first be gone over carefully so as to discover their full meaning, and the answers then written, if possible, from memory. If in doubt as to an answer, the student should recur to the lecture and again go over the difficult portion very carefully.

Make all answers brief and to the point, but do not omit important particulars. Do not presume upon the knowledge of the quiz master and leave it to him to guess at your meaning. Answer all questions as if you were explaining the matter to some person entirely unacquainted with the subject.

Write neatly and plainly, and be careful to spell all words correctly.

Try not only to study about things, but as much as possible study things themselves. When an experiment is given, or a reaction described, make an attempt to perform the experiment and to obtain the reaction.

When a drug is under consideration, no matter how often you have handled that particular substance before, obtain a sample and observe it in connection with the lesson. Note its general appearance carefully, distinguish all the different parts visible to the eye or by means of a simple magnifier, smell it, taste it, examine its preparations and note their properties and doses.

It will be profitable to have at hand a good dictionary, and to consult it whenever a new or unfamiliar term occurs.

If after a careful search for the answer to a question it is not found, ask some one who knows, but always first make an earnest effort to discover the answer for yourself.

To the untrained student some of these directions may seem trifling or unnecessary, but it will be among those who most clearly appreciate their significance and conscientiously follow them out that the prize winners will be found at the end of the course.

THIOL, A SUBSTITUTE FOR ICHTHYOL.—Dr. Wirz, in Deutsch. Med. Wochensch., states that for a year past he has employed thiol in place of ichthyol in many hundred cases and with the best of results. Its first advantage is that it is odorless, hence not offensive to delicate patients. He says: "In inflamed conditions the analgesic properties of thiol surprised me. It can be used in inflammations of every description. Infiltrations are resorbed without the formation of pus, making incision unnecessary. In severe carbuncles, after removal of the pus, thiol allayed inflammation when applied around the wound on the infiltrated parts and pain ceased entirely. This was experienced in all inflammatory processes where thiol was used after the removal of the pus. Lymphangitis, even phlegmones caused by panaritium, insect bite and other causes quickly disappeared under thiol treatment. Inflammation of the face caused by decayed teeth, erysipelatous infiltration of scalp and face, severe infiltration of the neck which took a serious aspect owing to œdema of the glottis gradually disappeared under constant application of thiol. In a case of general furunculosis in a child, I directed to paint thiol over every furuncle, and soon experienced a complete cure. In a case of typhilitis I ordered thiol well rubbed on the abdomen twice a day. Recovery occurred in 8 to 10 days. Pain subsided 15 minutes after the first application. The best results are obtained with liquid thiol as supplied by the manufacturers, not by that prepared from powdered thiol with an addition of water."

THE PHARMACEUTICAL ERA

[*WEEKLY.*]

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Our Chicago Office.

The Chicago office of the Era is now located at 194 Randolph street, and is in charge of Mr. L. Brinckerhoff, who is well known to the drug trade through his long connections with the house of Morrisson, Plummer & Co.

NOTICE TO STUDENTS.

Next week the regular lectures of the Course in Pharmacy will be started, and each member of the class is cautioned to save his copies of the ERA from the beginning so that he will have these lectures complete for reference in subsequent years whenever he wants to look up any subject treated therein. For the convenience of our subscribers we furnish an Era Binder at the low price of 75 cents each, postage paid. These Binders will hold all the ERAS complete for an entire year (2 Vol.) without the advertisements.

With each volume (6 months) of the ERA we furnish a complete Index, and the subscriber who does not preserve his copies with these Indexes is denying himself one of the most valuable works of reference for a druggist's library.

Era Course Begins Next Week.

In accordance with previous announcement the publication of the lectures in the Era Course in Pharmacy will commence in next week's issue, Sept. 2. All details have been perfected for carrying on the work systematically and without interruption. The enrollment of students has been especially satisfactory, and the ambition and enthusiasm manifested are an earnest of the good work that will be accomplished by these young men and young women anxious to gain a pharmaceutical education.

The Era Course is no snap experiment, not the result of a momentary impulse or careless thought. It is the outcome of the thorough consideration, for a number of years, of the problems of educational nature and the conditions obtruding in the field of pharmacy in these United States. From study of college catalogues and reports of pharmacy boards it becomes apparent at once to any observer that there annually enter upon the practice of pharmacy very many more young men than receive diplomas from the colleges. Of those who do not go to college the educational acquirements vary widely. Some are thoroughly equipped in this respect, but they are the few; the great majority have succeeded in passing the board by hook or crook, but do not possess the kind and extent of knowledge which should be theirs to ensure their success and enable them to be a credit to the profession they propose to follow. They are, in other words, self-taught, suffering under all the deficiencies which attach to self-teaching, even at its best. It is for this class, these hundreds, yes, thousands, of future pharmacists, that this Era Course of Home Study in Pharmacy has been formulated. These young men would never go to college, not because they do not want to, but because they cannot, and this being the condition, it is a desirable and a praiseworthy endeavor to place within their reach an opportunity for securing an education which will go far toward filling the need which is pointed out. The alacrity with which these young men have grasped the opportunity is evidence of the existence of the necessity and their appreciation of the means of remedy offered them.

The course in its formulation and execution embodies the principles and methods of the best college curriculum. It is systematic, graded and thorough, a combination of didactic methods with practical manual training. The student cannot follow it to successful issue without doing the work; it is no short-cut to registration, but necessitates close application born of ambition and the determination to acquire an education for education's sake, other motives being secondary and subsidiary. This course in its inception and promises of fulfillment carries with it the best wishes and the hearty co-operation of the leaders in pharmaceutical education. They see in it an opportunity to make better pharmacists, to inculcate a desire for knowledge, and as the ultimate result a certainty of the betterment and advancement, however slight, of the art and science of pharmacy and its devotees. These teachers are above selfish considerations; they recognize no danger to the institutions with which they are connected, fear no falling off in the numbers of their own matriculates, but rather appreciate the indubitable fact that this course will in many instances create a desire for a college training in addition to itself in many a student who otherwise would have remained unaroused by ambition. Tasting creates appetite, and in nothing more than in education. Nibbling at the fruit of the tree of knowledge quickly causes one to wish to eat to satiety.

But the plan of the course and its details have been thoroughly explained and its merits are known to every reader. We wish to say but a few words of congratulation and encouragement to the students who will receive the opening lectures next week. Let us urge you, first, to be systematic in your study, arrange for an hour or two hours a day, and do not let anything of unimportant nature break in upon this arrangement. Then use this study time to the best advantage. Follow carefully the suggestions and directions of instructors and quiz masters. Consider nothing too trivial for notice. Above all things, be thorough. See that each point, each step, be mastered before proceeding to the next. Learning is like building a wall; stone is laid upon stone, but the foundation layers must be sound, and a defect in any portion renders the whole structure proportionately weak.

You will be kept in regular and close communication with the quiz masters; they will try to assure that you shall know what is taught, and they, ourselves and all concerned in the work want to be held by you as personal acquaintances to whom you may apply for assistance of whatever needed nature. But when all is said, success is in your own grasp, it depends wholly upon you whether you benefit from the work. So be earnest, thorough and ambitious.

Opiates and Poisons, and the Druggist's Responsibility.

A couple of cases reported in our news columns this week furnish excuse for calling attention to some of the druggists' moral as well as legal responsibilities. The case of the victim of the morphine habit suggests the question how far, if at all, can the druggist go in catering to the demands of this class of unfortunates.

We think it can be accepted as a legitimate conclusion that he should put this and similar articles in the same category as strychnine and other dangerous drugs and violent poisons, and dispense them only upon order of the physician. Some druggists argue that these unfortunates must have the stuff, some one will sell it; why not we? Two wrongs never yet made a right, and the druggist is false to his profession and to himself who excuses himself by such specious pleading.

This matter was ably summed up in a paper read a few years ago by a druggist at the annual meeting of one of our State pharmaceutical associations. Some of his expressions are caustic, and caused some discussion and considerable objection at the time, but all are worth reading and consideration. He said: "To what extent are we warranted in selling opiates? Are we justified in endeavoring to increase their sale? Are we true to our conscience when we meet the price of another dealer as represented by the would-be purchaser? It seems to me that the sale of opiates to the debased creatures who have become its slaves is the most disgusting and degrading feature of the drug business, and while I cannot understand how any one should desire to cater for such trade, I for one am perfectly willing that they should have it. An opium eater is naturally a liar and a thief; you would not dare trust one of them within reach of his or her coveted drug unwatched; their money is hoarded to buy that drug alone; they are outcasts from society; they are beneath the notice of the honest laborer; although themselves possessed of wealth, they are a disgrace to a pharmacy. Sneaks and hypocrites, what have we in common with them? I hear you say, 'but they must have their opium.' Why? Because by the aid of competition they have been enabled to purchase the drug that has degraded them. Who is responsible for this? Shame upon our profession, it is ourselves, who else sells the degrading drug? Who has reduced the price of morphine from a dollar to forty cents a bottle and opium from seventy-five to twenty-five cents an ounce? Ourselves. Who has reduced the price of laudanum from fifteen to five cents an ounce? Ourselves. Who delivers laudanum unlabeled at request? The pharmacist. Does he do this blindly? No. He knows full well the regular customer, he needs not to ask his wants, the extended bottle, taken, filled, delivered without a word, tells only too plainly the miserable pitiful story of a ruined life. For a few paltry dollars reeking with misery and degradation, we have competed as for a prize. It is a disgrace, and a blotch upon our escutcheons, placed there by our own hands. We alone are responsible for the enormous sale of chloral, cocaine, opium and its products, and others of their miserable kind, by the pharmacists of the world. We owe it to ourselves to remove the stain, cost what it may. Will we do it?"

The other case under comment concerns the sale of poisons. A drunken man first sends his little son for carbolic acid with the statement that he wants it in order to kill himself. Not getting it, he goes to the druggist in person, makes a disturbance, and leaves with the announcement that he will find some other druggist who will sell it. Of course no druggist would have sold the poison under the circumstances. It would have been manslaughter, if he had. The question is whether a busy druggist can be asked to go out of his way to follow up such a case and prevent the threatened suicide. On what charge could he have such a man arrested, since no crime has yet been committed? Few people would regard it a duty to take the maudlin threats of a repentant inebriate seriously and go to the trouble of rendering his self-destruction impossible. And yet this man meant business. He bought some carbolic acid elsewhere, drank it, and got his name in the newspapers. Fortunately what he drank was not strong enough to kill him, but that was not his fault. Would the druggist have had any reason to reproach himself, if the man had died?

It seems to us that there is a higher law than that on the statute books regulating the practice of pharmacy. It seems to us that there is a higher duty than that of refraining from things forbidden. It seems to us that after a druggist has refused to sell poison under such circumstances, his duty as a man begins. Anybody who has wit enough to practice pharmacy ought to be able to get up some charge that would serve to cause the arrest of an intended suicide. In this case the customer was violent and abusive. In any case a charge of probable insanity would serve to place such a person under the protection of the police.

In commenting on these two cases it is not intended in any way to criticise the action of the druggists concerned in them. There is no evidence that one ever sold morphine or that the other neglected his duty as it then appeared to him. But it is an excellent time for every druggist to ask himself if in the sale of narcotics, poisons and liquors he is observing both legal and moral obligations.

Poisonous Plants; Government Reports.

The paper in this issue describing certain common poisonous plants is well calculated to be serviceable to druggists. Beside the descriptions of the physical characteristics of the plants mentioned, it goes with some detail into the matter of the treatment of cases of poisoning by them. The directions given for ivy poisoning, for instance, could well be held in mind by every druggist, for this is a specially common variety of ailment or affliction which the druggist is called upon to alleviate. The article is carefully prepared and thorough so far as it goes. The plants considered are those of which we hear most often.

The mention of this particular paper gives occasion for calling attention to the large mass of distinctly valuable as well as interesting information which is embraced in the various publications of the government. The reports of the Agricultural Department are a veritable Klondike of matter of this character, but as yet barely discovered, not to say developed to any extent. It is a shame that all this good material is put to no better use than it is. It is written in easily comprehended language, and very much of it is suitable for the "general-information" column of the newspaper. What the government seems to lack is a bureau of publicity, or advertising department, to let the people know what it is doing. The reports under notice contain information on subjects affecting the farmers, such as plant and insect pests, the care and feeding of stock, the choice and use of fertilizers, etc.; for the household are papers on disinfectants, on the composition of common foods, spices, etc.; a little more technical are the articles upon mineral resources and the flora of the country; in short there is something for every one. But we don't know it. There ought to be some way that this great mass of rich material could be put in the hands of those for whom it is prepared, but it is now largely buried, little is republished in popular prints, and most goes to waste, without application. Druggists who wish to take advantage of every opportunity for information and benefit would do well to get their names on Uncle Sam's mailing list.

Poetry in Botany.

Sermons in stones and lessons in the running brooks is a trite saying, but weighty with significance to the lover of nature, he who finds in the primrose by the river's brim something more than merely a yellow primrose. The devotee of any science finds that its beauties and lessons unfold to him in strict relation and proportion to his progress in discovery and research. That all this is appreciated by at least one ardent scientist is proven by the news report coming to us from our Philadelphia representative, who tells us that in that city a well-known botanist— a man with a heart for nature—not a mere miser of Latin names, is attracting the attention of Pennsylvania plant-lovers—scientific and lay—by a lecture which he calls "The Poetry of Botany." The lecture was first read at the Ocean City meeting of the Maryland Pharmaceutical Association, and recently again at a meeting of the Lotus Club at Woodstown, N. J. The lecture could be said indeed to open the door for a new religion, and it is hoped that the question here presented may stimulate worshipful thought in that direction, so that when the apostle of the Flower Kingdom does arise he will find the ground prepared for him. The poet-botanist referred to heads his lecture with Emerson's lines—

* * * "Some scholars
Love not the flower, they pluck it, and know it not,
And all their botany is Latin names!"

The purpose of the essay is stated in the first paragraphs: "The query very naturally suggests itself; is the chief aim and object of the study of botany merely to memorize lengthy scientific terms and names which are doomed to be replaced by others at the next revision of our text books? Or, is there a higher purpose connected with the knowledge of flowers and living organisms in general, which may in a measure satisfy both the poetical aspirations and the religious cravings of man?"

The essay here describes in beautiful language the mystery of the spring renaissance, and how it has baffled great thinkers of all ages. Continuing, it explains the origin of nature myths and shows how the vegetable world could well be the object of the intellectual man's study and worship. In conclusion the writer says: "We can still farther increase the pleasure of existing as a sentient being by having a formal introduction to each one of Flora's sweetest treasures, so that when we next meet them we may be able to call them familiarly by name. When the annual resurrection of nature opens the wintry tomb we find one by one of our old friends coming back in their perennial youth to renew their acquaintance and to bind still tighter the bond of friendship with us. Day by day we add to the ever-increasing number of our friends while we also obtain a clearer insight into their habits, customs and little peculiarities. Possibly we may invite one or the other of our favorites to take up their abode in our home, so that we may watch over and care for them.

"We feel that we have a new aim and purpose in life, a never-ending source of innocent recreation, a most valuable means of occupying our leisure time, and of adding to our general information.* * * * * *

"Having thus invited earnest attention to a few of the charms that pertain to botanical studies, let us ask in conclusion for a valid reason why we should not prefer them to the card tables, to silly social gossip or to bacchanalian revels? Is not a botanical excursion in search of living specimens an infinitely more intellectual recreation than attendance at a baseball or football game or slugging match? We may with profit learn a lesson from the far East, from old India and Persia, where every indigenous flower has become the symbol of some attribute or idea. Hence it speaks a language to the Hindoo or Parsee of which we have not learnt the alphabet, as our interest in flowers is usually more sensuous. We may admire their color, their form or their odor, and if these gratify us we are content!"

Is there not enough of argument and reason in all this to make one want to study botany?

New York a Frauds' Paradise.

The famous B. Blank gang has been let off and the fradulent mail order swindlers are celebrating a glorious victory. B. Blank is the name of a reputable grocer at 344 Greenwich street, New York. Two years ago mail orders were received by hundreds of manufacturing and wholesale houses from B. Blank, 29 Murray street. The commercial agency books do not contain street addresses, as they should, and a great many persons were taken in by the Murray street concern, the head of which was Henry Seelig, who had been well known in the trade at one time as a dealer in sponges in Burling Slip. A year ago last spring the whole gang was bagged by the police, and their business was broken up. The indictments against them have been hanging fire ever since, but on August 18 a judge in General Sessions dismissed the indictments.

This occurrence simply emphasizes what the Era has been reiterating for the last two years, that in business eternal vigilance is the price of success. As fast as these fraudulent brokerage houses come to light they are exposed in this paper, and the names should be posted in every wholesale drug house in the United States. Any drug merchant discovering such a concern is requested to communicate with the Era, that a warning may be sent out for the benefit of the trade at large.

This system of guarding against fraud is only rendered necessary by the negligence of public servants whose duty it is to secure evidence and convict the scoundrels who skulk behind reputable names or otherwise obtain their living by false pretenses. It is a fact that for ten years past it has been growing more and more difficult to punish crimes against property in New York City. This fact was frankly admitted recently by the New York District Attorney, who said that it was almost impossible to secure an indictment against a debtor on complaint of a creditor, because the courts are reluctant to lend their machinery to the collection of debts. Judges in their charges to the grand jury have even called attention to the necessity of preventing collection agencies from using the State for their own ends. Of course, the obtaining of an indictment against a debtor to enforce payment, and then refusing to prosecute, is an abuse of the law, but it is possible for the grand jury to err in the opposite direction. In case a merchant has been defrauded, is be to have no recourse if the fraud was accomplished in accordance with business usages?

The truth is that while the mail order frauds put up a very clever counterfeit of conducting business in accordance with usage, their chief reliance is upon the personal influence of their attorneys, who are in a number of instances ex-assistant district attorneys or the intimate cronies of influential politicians. Tammany was more watchful of the interests of business men than the reform administration is, and unless the business community receives the kind of public service it is entitled to there will come another shake-up that will loosen the teeth of some public officials.

CHEMISTRY OF PLANT COLORS.

The delicate and fleeting tints of the flowers, when looked at purely from a chemical point of view, are due to dyes—definite chemical compounds contained in the petals. Many of these have been isolated and analyzed. A few of the most common are described in The Naturalist by Dr. P. Q. Keegan, an abstract of whose article is quoted below by Literary Digest from Natural Science (London, July,) as follows:

"The buttercup owes its brilliant golden hue to a pigment called carotin (from its presence in the carrot root), 'which is amassed in discoidal bodies that nearly fill up the cells of the epidermis, especially toward the base of the petal; in other parts, especially when the flower is fully expanded, it seems diffused in oily droplets or amorphous granules.' In either case the starch grains in the subjacent tissue act as a reflector, and contribute greatly to enhance the effect. The flower heads contain a considerable amount of sugar, starch, calcium oxalate, and soluble phosphates, in these respects approaching more to the character of leaves than is usual. The stem and root of this buttercup (Ranunculus bulbosus) are remarkable for the presence of an acrid camphoraceous body easily decomposed into a volatile bitter principle (anemonin) and an acid, even during the drying of the plant, so that its original poisonous character disappears.

"Bird's foot trefoil (Lotus corniculatus), with brilliant orange and crimson tints of its little papilionaceous flowers, is known to every one. To produce this vividness and luster the epidermal cells are swollen into papillæ, and contain no less than three distinct pigments. There are the solid carotin corpuscles, and also two coloring matters in solution in the cell sap. One is a clear yellow juice, the other is identical with the anthocyan of the rose. Where the latter predominates we get the deep red color.

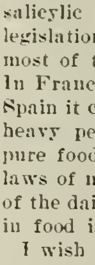
"The tiny flowers of the cheerful little yellow bedstraw (Galium verum) contain carotin, much yellow resinous matter, and 'a curious purplish substance (possibly purpurin) insoluble in cold alcohol or benzene after purification.' The flowers also contain a species of ferment, which, like rennet, has the power of coagulating boiling milk. A substance known as rubichloric acid is present, not only in the flowers, but in the stem and root. It forms a colorless solution in water, but when boiled with a few drops of hydrochloric acid suddenly produces a deep blue, then a green color, and deposits a dense, dark green precipitate soluble in ammonia. The disk florets of the daisy are tinged with carotin granules; the crimson of the ray florets is due to a soluble pigment described as a tannin anhydrid. The blue of the harebell and chicory is again a tannin derivative.

"Two coloring matters are engaged in the decoration of the primrose. At the base of the petal limbs, where the tint is more deeply orange, carotin granules are present; the rest of the corolla contains a pale yellow, soluble pigment. Although the tints are comparatively feeble, chemical analysis shows that the plant is capable of 'an infinitely richer wealth of coloration' than it shows in our climate, since 'it seems almost impossible to exhaust the flower heads of substances which yield vivid and powerful orange and yellow dyes.' "

WHAT ARE SPARKLING WINES?—The Board of Appraisers at this port was recently called upon to render a judicial decision in a case where the duties chargeable hinged upon the definition of "sparkling wines." To this end the board received evidence from a number of persons engaged in the wine trade, some of whom represented large business firms, well known throughout the country, and their testimony was concurrent to the effect that all wines which foam or effervesce are bought and sold in trade and commerce in this country as sparkling wines, whether their effervescence is produced, by natural fermentation or by the injection of carbonic acid gas. All such sparkling wines are contained in bottles of standard shape, being of unusual strength, and having a cone which adds to their strength; and as champagne forms the bulk of these wines, such containers are known as champagne bottles. The corks are further secured with cord or wire, generally the latter, and have a cap or capsule over them. Importations are constantly made of sparkling moselles, sparkling Rhine wines, sparkling Burgundies and others; these are all bought as sparkling wines and are never offered as still wines. They are commercially considered as sparkling wines without reference to the country of production, or whether they are artificially charged or the sparkle is developed in the natural way.

SALICYLIC ACID IN FOOD.—It is well known today, says the Sanitarian, that salicylic acid is a powerful antiseptic. As such it retards the action of organized ferments like the yeast plant and putrefactive bacteria. Its action on unorganized ferments is even more powerful. It completely arrests the conversion of starch into grape sugar by disease and pancreatic extracts. This action is directly opposed to the process of digestion, and, were there no other reason, the use of salicylic acid should be universally condemned. These facts in connection with salicylic acid have been recognized very thoroughly in legislation. The use of the acid has been condemned by most of the European countries having pure food laws. In France it is forbidden by law. In Austria, Italy and Spain it cannot be used without the danger of incurring a heavy penalty, and all South American States having pure food laws have absolutely forbidden its sale. The laws of many of the States forbid its use. By a decision of the dairy and food commission the use of salicylic acid in food is prohibited in Pennsylvania.

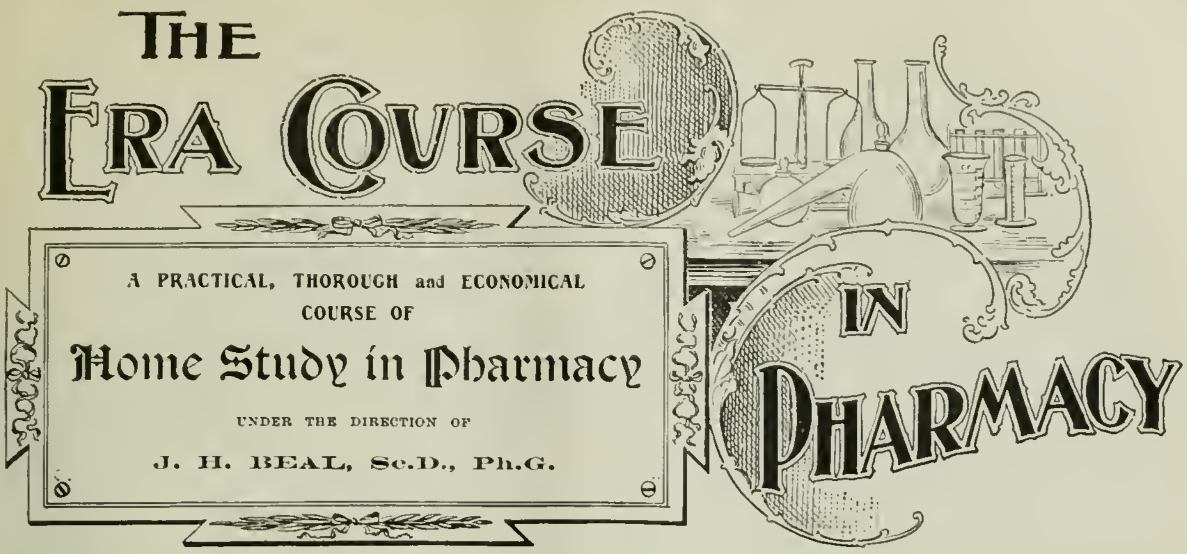
I wish to call attention here to another fact in connection with the use of salicylic acid which is of extreme importance, viz., the sale of preservalines, preservatives, etc., under various high-sounding names, intended for use in private families. A number of these, claimed to be perfectly harmless, are on the market, but actually contain salicylic acid as the main ingredient. The conscientious and careful housekeeper should put an absolute veto upon the use of any such compound. There is rarely any need for them, since, when pure fruits and vegetables are used and the proper directions for sterilizing by heat, etc., are carried out, canned or preserved goods of all descriptions can be prepared that will remain in good condition for years without the aid of any preservative.



MARKING UP THE SCORE

in the Era advertising contest will soon be in order. The competition expires with this issue, and the advertiser receiving the most replies up to Sept. 15 from his July and August advertising wins the prize. Don't fail to answer all the advertisements that interest you.

(See page 19.)



THE ERA COURSE IN PHARMACY

A PRACTICAL, THOROUGH and ECONOMICAL COURSE OF

Home Study in Pharmacy

UNDER THE DIRECTION OF

J. H. BEAL, Sc.D., Ph.G.

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THE NEED FOR BETTER PHARMACEUTICAL EDUCATION.

Opinions may differ as to the causes which are responsible for the prevailing depression in dispensing pharmacy and of the best means of correcting them, but all who have studied the subject carefully unite in the opinion that no general or lasting improvement is possible without the better education of the rising generation of pharmacists.

The public demands a better education of the pharmacist than formerly. The pharmacist has not kept pace with the immense improvement in educational facilities and the consequent advance in general educational standards, and therefore does not occupy the same relative position in the community that he did a quarter of a century ago. At that period, except in the older states, the lawyer, physician or dentist commonly learned his profession by reading in an office with some practitioner for a few weeks or a year, assisting in the work of the office, when possible, and was then admitted to practice by examination before the committee of some local professional society. To-day there are few States where such an admission to professional life is permitted, and even where permitted the influence of public sentiment operates to exclude such practitioners from all but the least desirable patronage.

With the old lawyer, doctor or dentist the pharmacist of the same period compared favorably; with the new ones he does not. The improvement of the facilities for pharmaceutical education have advanced wonderfully within that time, but the pharmacist has only to a limited extent availed himself of his increased opportunities.

Some will say that the profits of the pharmacist will not justify him in going to the expense of obtaining a good education, but this is a false and foolish doctrine. There is nothing in the world which always has paid and always will pay so well as a good education. Those who dispute this do not distinguish between the truly educated man and the traditional "learned fool." The former is the man whose training fits him to extract success from his calling under conditions where others fail; the learned fool is the man who would have been a fool in any condition, and who has filled himself with information that is useless simply because he does not know how to use it.

The practical aim of an education for any calling is the preparation of him who undertakes that calling to meet and solve its problems, to overcome its difficulties, and to make it yield a livelihood for himself and those who are dependent upon him. An education which accomplishes this discharges its mission, both to the individual and to society: an education which fails in this respect fails in the most important part, no matter how excellent it may be in other particulars.

Not only do public and professional standards demand a better educated pharmacist, but his business demands it of him. If it is less profitable than it used to be, it is not less exacting in its requirements. The therapeutist has ransacked all the kingdoms of nature and enlisted the resources of all the sciences to obtain the materials for the treatment of disease, imposing upon those who undertake to supply his wants the burden of familiarizing themselves with all substances and with all sciences.

The druggist who began his studies before this flood of new remedies had come into materia medica was able to familiarize himself with each new substance as it appeared, but to the student who has lately entered into pharmacy, such a course is no longer possible. He cannot take them up singly for want of time, nor can he study them en masse because they are incomprehensible unless classified and arranged according to their natures. In order to understand them he must understand laws and principles, he must know how to classify and arrange, and how to apply general rules to the solution of special problems. These qualifications can be acquired only by the aid of systematic instruction, graded courses of study and regular recitations.

The Nature and Purpose of the Era Course.

The Era Course in Pharmacy antagonizes none of the existing methods of pharmaceutical education. It desires to co-operate as an auxiliary in all legitimate educational enterprises, to displace none, and to occupy the territory not already occupied by those agencies.

It aims to supply a graded course of study, to furnish the student the advantage of the direction of experienced instructors, and to ensure the efficiency of these means by providing a system of recitations which will compel thoroughness and promptness, and discourage desultory and careless reading.

Possibly an occasional student might be able to gain for himself an education without the direction of instructors or the spur of recitation, but only at the expense of much valuable time and labor which might have been avoided had the steps of his intellectual development been properly directed, while for every one who succeeds by this method ninety-nine will fail utterly and quit in discouragement.

For the Home Student.

Unfortunately many of those who have a thorough appreciation of the usefulness of pharmaceutical education, and of the necessity of systematic instruction, graded studies, and regular recitations, have nevertheless been unable to avail themselves of these benefits. It is in supplying the needs of such students that the Era Course finds its special mission. Those who have been deterred from availing themselves of such instruction because of the expense connected therewith now have the opportunity of obtaining the object of their desires at a cost so nearly nominal that it should be possible for every one who seriously desires to obtain an education in pharmacy to avail himself of its advantages.

For the Pharmacist.

Another aim of the Era Course is to supply the wants of those pharmacists whose age and business obligations are such as to deprive them of the hope of ever being able to pursue a course at a regular college of pharmacy. Many of them entered the drug business years ago, have served their apprenticeship faithfully, and are really excellent pharmacists, but find themselves at constant disadvantage when compared with younger men of smaller information, but better training.

A man with a comparatively small amount of well-arranged information, and with well-trained faculties, can accomplish more than the untrained man with a vast store of information gathered miscellaneously and without system. The difference between the knowledge of the two men is the difference between a drug stock properly classified and arranged in cupboards and cases, and one left just as it was unpacked from the boxes.

The systematically trained man is "at himself" all the time. He knows the limits of his capacity. When an emergency arises he can deal with it confidently, or knows where to look for the information which he requires.

Many very worthy pharmacists are to-day in the condition of the man with the ill-arranged stock of goods. During their years of experience and observation they have gathered an immense amount of valuable information, but are unable to use it to advantage for its lack of proper arrangement. They hesitate at every step, uncertain how to proceed, and send out many a mixture, wondering whether the next morning's paper will not contain the account of another druggist's blunder. For such persons the Era Course should prove itself of invaluable assistance. It will enable them to gather up the loose ends of information which they already possess and to arrange them into an orderly and systematic whole.

For the Graduate.

For the Graduate in Pharmacy the Era Course will afford an excellent opportunity for review. Perhaps but few men complete their college studies without expressing the wish that they could begin and take their college work over again. The Era Course furnishes exactly this opportunity. By following the lectures as they appear he will retraverse the ground of a complete college course, and a good one at that, while the time required each week is no more than would otherwise be spent upon the gossip of the newspapers or in looking idly across the counter. The written recitations will afford him all the benefits of an oral quiz, added to the benefit derived from the attempt to reduce his thought to writing. To the student in attendance at the college of pharmacy the Era Course should prove a very valuable help, the printed lectures as an admirable supplement to the scant and scrappy notes which he must take of the college lectures, and the written recitations as an excellent preparation for the regular college quizzes.

But the usefulness of the Era Course is not exhausted with the service of those who desire graded and systematic instruction in the fundamental principles of the theory and art of pharmacy. Its aim is to furnish something of interest to every one who is connected with or expects to be connected with the preparation and dispensing of medicines.

For those who are interested chiefly in obtaining practical points for use in the daily conduct of their business affairs there are papers on special business topics by business experts. These papers alone should repay the practical druggist for the expense of his subscription.

A similar provision is made for the wants of those who are interested in scientific pharmacy in the lectures upon special scientific topics, dealing with the scientific work which the pharmacist can conveniently take up in connection with his regular duties, and by which he can not only enhance his reputation as a professional man, but add materially to the profits of his business by the fees gained for professional services.

NITRAGIN, as defined by General Appraiser Lunt in an opinion rendered in a case where the importers protested against the decision of the collector of customs at this port regarding the rate and amount of duties chargeable thereon, is the product of the cultivation of myriads of bacteria in gelatin and claimed to be a germ fertilizer, by the use of which it becomes unnecessary to apply to the soil nitrogenous manures and fertilizers, in the form of saltpeter, ammonium salts, etc. Nitragin is designed to be a fertilizer for leguminous crops, and it is applied to the seeds in solution in water, or is mixed with a quantity of earth which is scattered over the field and worked into the soil. The theory of the discoverers is that the seed or the soil is inoculated by this fertilizer; that every seed is surrounded with bacteria which, after germination, penetrate the roothairs and commence their role as collectors of nitrogen, so that a good crop is secured in the poorest soil without other fertilizers.

SOME COMMON POISONOUS PLANTS.

By V. K. CHESNUT.

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General Remarks.

The plants commonly looked upon as poisonous are those which through general experience, history, or tradition have long been known to produce some ill effect upon animal life. The number recognized in any country tends, therefore, to be proportional, not only to the variety of its flora, but also to the antiquity of its civilization; and the popular estimation of the virulence of any particular plant depends in great measure upon the number of its victims as well as upon the rapidity and violence of its effects. The literature of these plants is filled with allusions to species growing in Hindostan and the Greek and Roman provinces, and history teaches how certain species, such as the peach (for its pits and leaves) and the hemlock, came to be especially dreaded by the ancients on account of their extensive use in putting State criminals to death. The literature of Europe contains the names of over three hundred and fifty plants, which, in that quarter of the globe, have been known to produce ill effects upon man or animals, while in North America there are only a few which have been generally recognized as poisonous, and these grow mostly in the eastern and more thickly settled half of the continent. Very little is known concerning those which are native to the region west of the Mississippi River. Those chiefly reported in the newspapers throughout the United States are poison ivy, the so-called "wild parsnip," and certain fleshy fungi commonly known as toadstools. It is true, however, that a considerable number of plants should, at least provisionally, be ranked as poisonous in the flora of a comparatively new country, such as the United States. It is a fair presumption that every plant is poisonous which is very closely related to a species recognized as virulent in other countries. It is prudent, also, to suspect all plants popularly supposed to produce ill effects, regardless of the results of analyses hitherto made, for the chemical and biological investigations of plant poisons is as yet too little advanced to furnish conclusive data in all cases.

There are several causes which tend in the United States and elsewhere to an underestimate of the number of poisonous plants. In the absence of statistics, objection is made to an increase in the number of ill-reputed species for æsthetic reasons, and on the ground that plants exist for consumption by animals, and can not therefore be poisonous. These ideas are wholly without scientific foundation and are deplorably misleading; indeed, instances might be cited where men have nearly sacrificed their lives in attempting to verify the supposed innocent nature of certain plants which authorities have declared harmless. Yet, it is impossible to refute these ideas all at once, on account of the apparent uncertainties and contradictions which the subject presents to the novice. A full acquaintance, however, with the preparation of drugs and with their action upon animals removes many of these uncertain factors.

It is characteristic of organisms, both plant and animal, that their elements are slowly but constantly undergoing chemical changes. During health these changes take place naturally and afford heat and nourishment. In sickness they take place with greater or less rapidity, according to the chemical nature of the compounds involved in the disease, and are modified by the proper application of drugs.

Poisons differ from foods and medicines mostly in the rapidity, but also to some degree in the character, of the chemical changes which they produce. They are therefore to be considered as substances which are unstable or extremely liable to change. This fact has always been recognized to a limited extent by experts, but it has only somewhat recently become known that certain plant poisons are destroyed even by the addition of alcohol, or by simply heating to a temperature of 60° C. Thus, the poison is subject to destruction in the process of analysis. Further than this, it may not exist in the part analyzed; and, moreover, the amount varies greatly in the same species, according to climate and the conditions of soil and season.

Again, the susceptibility of animals differs greatly. Some are little, if at all, affected by poison taken in quantities which, judging from the effects produced on others, should cause instant death. This may be due to differences in physiological functions, in character of food, or in natural or acquired habits. It is well known, for example, that large quantities of certain poisons, such as strychnine, opium, and arsenic, can be taken with impunity by man after the long-continued use of small doses. May not the endurance of certain animals be explained on analogous grounds? Other factors which determine differences of action are age, sex, temperament and idiosyncrasy; the latter explains why strawberries are poisonous to some individuals.

In the widest sense, therefore, all those plants should be classed as poisonous which have ever produced ill effects accidentally, and not those alone which the combined knowledge of the botanist, the chemist, and the animal expert has proved to be such. Especially should this view be taken in a new country, and in the case of plants likely to tempt the appetite. By this cautious attitude the dangerous plants can be ascertained and antidotes be determined without repeated sacrifice of life and property.

Chemistry has already rendered much service in explaining the obscure behavior of some of these poisonous plants, and it is believed that recent discoveries will point out the true character of some species which have hitherto baffled all scientific progress.

Poison Ivy.

The poison ivy (Rhus radicans) occurs abundantly throughout the United States east of the Great Plains, and in greater or less abundance throughout the less arid regions of the West, with the exception of California, where it appears to be entirely wanting in all localities. It grows everywhere in the open brush, in ravines, and on the borders of woods, and it spreads along roadsides and cultivated fields from seeds carried by crows and other birds which feed upon its fruit. It is generally a climbing vine, but if no support is at hand it either trails along the ground or sends up short vertical shoots.

Besides one near Western relative, which is almost as poisonous, there are no other plants which resemble it closely excepting the non-poisonous box elder, the leaves of which bear a striking resemblance to those of the ivy. It is only in its seedling stage, however, and when growing along hedges, that the box elder could be taken for ivy. The Virginia creeper, also non-poisonous, is sometimes mistaken for the poison ivy, but it is easily distinguished by having five, instead of three, leaflets, all of which spread out from a common point, like the fingers of the hand.

Perhaps no plant is more popularly recognized as harmful than the poison ivy. Its effects upon the human skin are familiar to every one, and as its victims far outnumber those of all other species combined it has come to be regarded as the principal poisonous plant of America. Some of its other common names are poison oak, poison vine and mercury. Its nearest relative is a plant known to botanists as Rhus diversiloba, which grows in similar situations at low altitudes throughout the Pacific coast from Lower California to Canada and northward. Western people call it poison oak because the leaves, though very unlike those of the common Eastern oaks, bear a considerable resemblance to the common species of the West. The leaves differ in size, as well as in shape, from those of the poison ivy. Ranked together in the same genus are two other poisonous plants, which, although they produce the same effect upon the skin, are yet totally different in their gross appearance, being thus more closely allied to the sumac or non-poisonous species of the group. Only one of these is at all common, and that is the poison sumac (Rhus vernix), which is found growing in swamps from Florida to Canada and westward to the Mississippi Valley. It is a shrub or small tree, 6 to 18 feet in height, with long pinnate leaves having from 7 to 13 smoothly polished leaflets. It is also commonly known as "poison dogwood," "poison ash," and "poison elder." The other poisonous sumac (Rhus michauxii) is a rare shrub, recently rediscovered in North Carolina.

Poison ivy has long been regarded by the ignorant with a degree of awe akin to superstition. No one was able to tell how it produced its effects, and why it attacked some people and not others. Mysterious principles were relied upon to explain the phenomena, and up to the present time the common belief has been that the poisonous constituent was really an exhalation from the plant. In the latter part of the last century it was so regarded by the expert; then, as our knowledge of plant chemistry advanced step by step, it was attributed more concretely to a specific gas, a volatile alkaloid, and a volatile acid like formic acid. More recently still, bacteria have been accused of causing the affection. Experiments have seemed to verify these ideas in turn, but the falsity of all has at last been proved by the discovery of a more tangible compound. In January, 1895, Dr. Franz Pfaff, of Harvard University, announced that the poison is in reality a non-volatile oil. Numerous experiments have been performed with the purified oil, and it has been shown to produce exactly the same effects as the plant itself. Dr. Pfaff has called this substance "toxicodendrol." It is found in all parts of the plant, even in the wood after long drying. Like all oils, it is insoluble in water, and therefore cannot be washed from the skin with water alone. Alcohol dissolves it readily. Alkalies saponify it, and thus render it inert, but this result is more easily obtained by an alcoholic solution of the sugar of lead (lead acetate). Numerous experiments show that when the smallest amount of this oil is applied to the skin it is very gradually absorbed in the course of a few days, and that within certain limits the longer it remains upon the skin the greater will be the effect produced.

In an experiment performed by the writer at the Department of Agriculture the oil was applied to four spots on the wrist and carefully kept from spreading to other parts of the body. At the end of an hour one of these spots was well washed with successive treatments of pure alcohol; in three hours another was washed clean in the same manner; the other two were allowed to remain three hours longer. The effect produced on the first spot was very slight; that on the second was more marked, but did not equal the effect produced on the other two, which was about equal. The affected places were all within an inch of each other, but all remained wholly distinct, a circumstance which very clearly shows that the affection is not spread through the agency of the blood. Subsequent applications of an alcoholic solution of the sugar of lead gave immediate and permanent relief. In practice it is not desirable to use strong alcohol, which is apt to be too irritating to a sensitive surface, but a weaker grade of from 50 to 75 per cent. should be preferred, and to this the powdered sugar of lead is to be added until no more will dissolve. The milky fluid should then be well rubbed into the affected skin, and the operation repeated several times during the course of a few days. The itching is at once relieved and the further progress of the malady is checked. The remedy has been tried in a large number of cases and has always proved successful, but it must be remembered that it is itself a poison when taken into the mouth.

Poison ivy being so great a public nuisance, it is strange that no legal measures have ever been carried out to suppress its growth. Municipalities protect their people against diseased food by the appointment of inspection agents, and farming communities defend themselves against the ravages of animals by bounties. Why should not this plant in some way be provided against, especially now that its poisonous nature and its antidote are so exactly known? Much would be accomplished if the owners of suburban places of popular resort were compelled to weed out the vine from their premises. The regulation might also be made to cover its destruction along the country roadsides.

The American Water Hemlock.

The American species of water hemlock (Cicuta maculata) is by far the most virulent plant native in the United States. It is found growing at low elevations, along streams and ponds, and in marshy ground throughout the eastern portion of the continent, not extending apparently very far west of the Great Lakes. It is perennial in duration and grows to a height of from 4 to 8 feet. In some river marshes it is so extremely abundant that in early summer the landscape is whitened by its bloom. It belongs to the well known parsley family, and may easily be distinguished by its fascicled, spindled-shaped roots, which are from 1½ to 3 inches in length, and by the trellised structure of the underground portion of its main stem. Both of these parts are strongly impregnated with a yellow, aromatic, oily fluid, which has an odor resembling that of the parsnip. A few of the common names by which the plant is known in various localities are, water hemlock, wild hemlock, beaver poison, musquash root, muskrat weed, cowbane and children's bane. It is frequently mentioned in the newspapers under the erroneous name of "wild parsnip." The plant is closely allied to the less common and somewhat less virulent poison hemlock (Conium maculatum) with which Socrates was put to death, but it has several nearer relatives equally poisonous with itself. Cicuta virosa, the species which is particularly dreaded in Europe, probably does not occur in the United States; C. bulbifera is found from Indiana to Delaware; C. vagans in Washington, Oregon, and Northern California; and C. bolanderi in California. All grow best in damp, marshy places, and closely resemble one another in external appearance and toxic properties.

The victims of these plants are chiefly but not exclusively herbiverous animals. The underground portions are the most poisonous, and as these are often washed, frozen or dug out of the soil during winter and early spring, they are sometimes eaten by children and by animals, the former mistaking the roots of the American water hemlock for horse-radish, parsnips, artichokes, sweet cicely, or other edible roots, the animals eating the various kinds because they are among the first green substances to appear in the spring. In marshes where any of the species is abundant, cattle are also said to be poisoned by drinking the water which has stood in contact with roots that have been crushed by being trampled upon. The poisonous constituent resides in the aromatic oily fluid already mentioned. This fluid has not been thoroughly analyzed in the case of the American water hemlock, but it is highly probable that besides conine all the species contain cicutoxine, a resinous substance which is characteristic of the water hemlock of Europe and is much more poisonous than the alkaloid conine. Cicutoxine was discovered in 1875, and has since been shown by animal experimentation to produce the same symptoms as the plant itself.

No estimate can be made of the amount of damage done to live stock by these various species, but it is not insignificant. The human victims of the American water hemlock probably average a considerable number per annum. In the State of New Jersey alone two quadruple cases of poisoning were reported during the spring of

1896, which resulted in the death of two individuals. Falck, a German authority, reports a 45 per cent. fatality in thirty-one cases of water-hemlock poisoning occurring in Europe.

The symptoms of poisoning are vomiting, colicky pains, staggering, unconsciousness, gnashing of the teeth, and frightful epileptiform fits, ending in death. As no chemical antidote is known, the treatment must consist in a thorough cleansing of the alimentary canal and in combating the symptoms as they arise by the use of chloroform, chloral, and such agents as seem to be indicated at the time. Herbivorous animals which have swallowed a sufficient dose generally die, but they are sometimes saved by two or three doses of melted lard, which tends to retard the absorption of the poison in the stomach, and also facilitites its expulsion through the intestines.

One case will show the general nature of the symptoms. At Boundbrook, N. J., in March, 1896, two boys and two girls, while returning from school for lunch, stopped to look at some workmen digging a ditch. One of the girls spied some water-hemlock roots which had been thrown out of the ditch and which she took to be horseradish. More were soon found by the others, and, as they proved somewhat agreeable to the taste, all ate of them to a greater or less extent. After arriving home, but before finishing luncheon, one of the girls was taken violently ill with dizziness and nausea, and was soon in convulsions. A physician was summoned immediately, but the girl died shortly after his arrival. The others were affected in the same way, but not so violently, and they were finally saved by skilful treatment. The species was determined from specimens sent to the Department of Agriculture and from plants grown from these roots.

The Death Cup.

The death cup (Amanita phalloides) is the most poisonous of all the fleshy fungi. It is found in summer and autumn throughout the greater part of the United States, growing upon the ground in the woods at medium and lower elevations. The stem is white. When young it is solid, but afterwards it becomes somewhat hollow and pithy. The base is surrounded by a characteristic cup-shaped appendage, the remnant of a veil which covers the entire plant when young. The length varies from 3 to 5 inches. The cap is viscid when moist, and is generally smooth and satiny, but it may sometimes bear fragments of the outer covering or veil. The gills and spores are white. Several varieties of the plant exist, the one most common having a white or yellowish cap; but this may be green or even spotted when growing in deep shade. The general shape is much like that of the common mushroom. It is also like that of the fly Amanita (Amanita muscaria), which is, perhaps, more common, but is less poisonous. From the former it is at once distinguished by its basal cup-shaped appendage, and a child can usually distinguish the fly Amanita by its more brilliant coloring.

The death cup occurs in Europe as well as in America, and it is mainly from European sources that our knowledge of it is obtained. Pliny ascribed numerous cases of poisoning to fungi, and it appears probable from the descriptions given that the poisoning was produced in most instances by the above plant or its several varieties. One foreign authority has collected 51 cases of poisoning caused by the death cup, 75 per cent. of which were fatal; and another has found descriptions of 48 cases which occurred in Germany alone in the years from 1880 to 1890. In the United States it is said that as many as 25 deaths during the summer of 1893 were due to some species of Amanita.

The amount of the substance of this fungus which is necessary to produce death is very small. The third part of a medium-sized uncooked cap is said to have proved fatal to a boy of 12 years of age, and smaller amounts have affected older persons very seriously. Even the handling of specimens and the breathing of the spores have apparently given rise to very pronounced uneasiness. The spores are also suspected of having caused trouble by being deposited on edible fungi which were placed in the same basket.

The fresh fungus is very inviting in appearance and has no bad taste when eaten either raw or cooked. There is no uneasiness felt by the victim until from nine to fourteen hours after eating. Severe abdominal pain then sets in, which is rapidly followed by nausea, vomiting and extreme diarrhœa, the alvine discharges assuming the peculiar rice-water condition which is characteristic of Asiatic cholera. These symptoms are persistently maintained, but without loss of consciousness, until death ensues, as it does in from two to four days.

Since the year 1869 death from Amanita poisoning has generally been attributed to the alkaloid muscarine (wrongly called amantine). This is true of a large number of cases. In some, however, it has been noticed that the toxic action was quite different, and that the effects could not be successfully counteracted by the use of atropine, which is a perfect antidote to muscarine and certain more or less closely related compounds. This difference seemed to be especially marked in the case of the death cup, but chemists were unable to isolate and describe its peculiar principle until recently. This was done in 1891 by Kobert at Dorpat, in Russia, and the substance was called phallin. Its characteristic action consists, not in inhibiting the action of the heart, but in dissolving the red blood corpuscles and permitting the blood serum to escape through the alimentary canal.

Phallin is a remarkable substance. Nothing like it was known to exist in plants until 1884, when abrin, the poison of the East Indian jequirity (Abrus precatorius), was isolated and described by two Englishmen. Mitchell, an American, had shown in 1860 that a similar substance existed in the venom of the common rattlesnake, and others have more recently shown that such compounds are not uncommon in nature. They are now known to exist in the venom of various serpents, in the poison glands of some insects, in the cultures of such pathogenic bacteria as those characteristic of diphtheria and typhoid fever, and in a few plants, such as the barbadoes nut and the castor-oil bean. All partake of the nature of albumen, and are therefore called tox-albumins. They are easily coagulated and thus rendered inert by a temperature somewhat below that of boiling water, and all dissolve readily in a solution of common salt. Phallin is odorless and tasteless, and, like the other tox-albumins, causes death only after a long interval. The fatal dose for cats and dogs is less than one-tenth of a milligram per kilogram (seven ten-thousandths of a grain per pound) of body weight, and death follows in from four to seventy-two hours.

Salt water is commonly used in the preparation of fungi for food, and some pretense at cooking is generally observed; such treatment, although it would not remove the poison of the deadly Amanita (Amanita muscaria), would, if thorough, totally remove that of the death-cup fungus. The uncertainty of an adequate treatment is so great, however, that the plant should be rejected as a food and branded as poisonous. The danger is made much more emphatic by the fact that there is no known antidote for phallin. When a case of poisoning occurs, the action of the muscarine-like compounds, which are in all cases to be suspected, is to be counteracted by the hypodermic use of atropine, but the ultimate effects of phallin are only to be offset by transfusions of common salt, or by blood taken fresh from the veins of some living animal. There is generally little need of agents to evacuate the stomach and bowels.

The following account of a case of poisoning by the deadly Amanita was reported in one of the Washington (D. C.) newspapers for Oct. 18, 1894. The report was verified and enlarged by consultation with the physicians who attended the patient. The victim, Chung Yu Ting, was a highly educated Chinaman, who was serving as interpreter in the household of a Russian nobleman. The fungus was identified by the microscopist of the United States Department of Agriculture.

Having been accustomed to eating fungi in China, Chung gathered a large quantity of this luscious-looking fungus and ate it at 2 p. m. on Saturday, after preparing it according to his own method. At 9 p. m. no ill effects had been observed, but shortly after midnight he was found in terrible agony. The vomiting and purging had been profuse, and in the bowl containing the vomit, the tough, apparently undigested, morsels of fungus were found in great numbers. Medical aid was summoned at once and hypodermic injections of atropine and morphine given, but apparently without effect. The discharge of blood and blood serum which began in the early course of the attack continued to be so profuse that it was soon found impossible to raise a blister on the abdomen by the use of cantharides. Nothing whatever could be retained on the stomach, and it was found impossible to give nourishment in any way. Hypodermic injections of nitroglycerine and strychnine were used with good effect upon the heart, but the continued use of atropine appeared to do no good. The rice-water discharges continued unchecked, and the patient's strength declined steadily until death occurred on the morning of the fourth day after the fungus was eaten. (Yearbook of Dept. Agriculture, 1896.)

IVORY: ITS SOURCES AND USES.

By N. B. NELSON.

Though an animal product, its combinations with wood, particularly ebony, from the earliest history, and the similarity of its uses and working in the way of carving, turning, veneering and inlaying, make ivory an interesting material to joiners, decorators and builders.

In texture, elasticity, hardness, peculiar markings or cloudings of the grain, and several other particulars, ivory is very like the harder woods, and, being of similar durability, is very suitable to "make up" in mosaics, inlaying, etc., with them, making a companion commodity.

Ivory is really dentine—that substance, not unlike bone of which teeth principally consist. By usage it is restricted to the dentine of those teeth which are large enough for industrial purposes, viz., the tusks of the elephant, hippopotamus, walrus, narwhal, and some varieties of whales. These forms of ivory differ about as the hard woods differ; the elephant ivory, by its size and quality, is best suited for all purposes; that of the hippopotamus is harder and finer, but owing to its hollowness can only be used for small articles. The old Norsemen used extensively the tusks of the walrus, and when "whaling" was at its best the sperm whale was sought almost as much for the ivory as for the oil. It was the writer's fortune to examine a whale's tooth which was nine or ten inches in length, and six or eight in circumference, and seemed solid ivory of a beautiful quality, but so hard as to defy every effort of its owner, who was an expert carver, spoiling, as he expressed it, his "tools and temper."

Ivory, consisting chemically of an organic matrix or growing element, phosphate and carbonate of lime, is permeated by numerous exceedingly fine canals, starting from the organic or pulp cavity and running generally outward to the circumference of the tusk. To the regularity and smallness of these canals ivory owes its elasticity, firmness, and fineness of grain; to their curvatures and eccentric direction—plainly visible in cross-cut sections—are due those beautiful cloudings and delicate markings which give value to, and readily distinguish the real from the imitated article.

Ivory is extremely hard and heavy—the very name, a Latin derivative from "barrus," an elephant, so called from a Greek word meaning heavy. It is difficult to cut, requiring the sharpest and hardest of tools, but yields readily to the saw, the lathe, the file. Owing to its value, which is so constantly increasing that it now ranks with the "precious" substances, the greatest care is taken to avoid waste in manipulation. The cutting is effected with thin saws. Large plates of veneer have been obtained by the "reciprocating" saw, cutting a spiral shaving round the tusk. There is an account of one thus produced which was forty feet in length and twelve inches wide. Polishing is done by the use of various powders.

Ivory is dead pearly white in color, which sometimes changes with age and exposure to yellow, brown, or black. This natural whiteness is exquisitely delicate, and, as an enthusiast in ivories expresses it, "bears a great resemblance to the brightest tint of the human skin, which latter is the most beautiful hue in Nature." On account of the yellowing with age, there have been many recipes for restoring its whiteness, but none have proved satisfactory. A fortune is in store for the inventor or discoverer of the "happy medium." The opacity and elasticity of old ivory can be partially restored, at least to be useful for some purposes, by boiling in a solution of gelatin.

The existence of statues and of placques of ivory larger than could be cut from any known tusk, render it probable that ancient workers possessed some method of bending or molding. It can be made flexible by a bath of phosphoric acid, but at the expense of many of its properties. It will also take a variety of dyes without interfering with its polish, particularly if the actual matrix or organic matter is stained.

The tusks of the elephant are an elongation of the upper incisor teeth, which may attain to enormous development; the largest are those of the extinct mammoth; some specimens have been found in Siberia more than twelve feet in length and two hundred pounds weight. There was a noted one of particularly fine quality, weighing one hundred and eighty-six pounds, that was cut up into piano keys.

Among the modern elephants the African possesses the largest tusks, often nine or ten feet in length, and weighing one hundred and sixty pounds each. A pair of African tusks were exhibited in London recently that weighed three hundred and twenty-five pounds, and measured eight and a half feet in length and twenty-two inches in circumference. Think of the muscular strength of head and neck necessary to support such a weight. The importance of these "ivories" in combat is evident by the dread of a "tusker" shown by elephants less favored. They are often broken in fighting, and always show marks of considerable wear. Even captive animals use them for a variety of purposes, e. g., a trained elephant, when directed to pull a rope, will take it between his molar teeth and pass it over one of his tusks to get a good purchase. Nothing of less strength and elasticity than ivory could withstand the strain to which it is constantly exposed.

Foreign bodies, as bullets, arrowheads, or spear points, are often found imbedded in ivory. It is not a rare occurrence for the sportsman's bullet, or the native's spear, intended to pierce the elephant's brain, to penetrate the pulp cavity of the tusk and there become encysted or grown over with ivory and apparently have given the animal no trouble; but occasionally the viciousness of a "rogue," or the evident insanity of some unmanageable creature has proved after death to have been caused by the suffering from inflammation and suppuration consequent upon the presence of a leaden ball in the "nerve of the tooth."

The best ivory is the African, and the finest quality from near the equator. Much of it is brought by natives from the interior to the coast and sold to Arab merchants, while many expeditions are organized by Europeans to go to the interior and collect the stores gathered by the native tribes. It is an extensive commerce. Four thousand pounds sterling, or twenty thousand dollars, is considered a good result for one season's expedition with one hundred and fifty men. Prices differ in different localities. The "portage," or distance from coast, size, condition, care in handling, and weight all affect price.

The African ivory trade is an ancient one, and in mediæval times Marco Polo, who lived from 1254 to 1324, speaks of the ivory traffic in Zanzibar being "astonishing in amount."

The tusks of the mammoth of northern Siberia, or the fossil supplies, are said to furnish almost the whole material of the Russian ivory workers. They are found in extraordinary abundance, and come principally from the neighborhood of the Lena and other arctic rivers and the coast islands. Mammoth tusks are more slender, more curved, and much larger in proportion than those of recent animals. Many have been found in the frozen morasses or in the solid ice, intact and in a beautiful state of preservation, having lain in their air-tight cases for many centuries.

Among the Scandinavians the tusks of the walrus have long been a source of ivory, and of very good quality, too. The spirally twisted tusk of the narwhal is the desideratum of the Eskimo hunter. Asiatic ivory is from India and Ceylon elephants, which are rapidly disappearing. America has some fossil deposits and "glacial preserves" of mastodon ivories, but they are more sought for museums and antiquarian collections than for any commercial value.

The uses of ivory are exceedingly varied. The large cuttings are for veneer, plaques, panels, and portraits; then billiard balls, knife, cane, umbrella, and brush handles, piano keys, buttons, measuring rules, mathematical scales, statuettes, caskets, chessmen and draughtsmen, furniture decorations and an endless variety of ornaments and works of art.

Ivory working is one of the oldest industries. Numerous references occur in the Old Testament, which show that the material was regarded as of great value. It was an element in temple decoration, and is often mentioned among the presents to kings, who employed it for regal state. The ancient Egyptians and Assyrians used it extensively.

The excavations of Nineveh, a city that dates nearly 2,000 years B. C., have supplied the British Museum with ivories of very great antiquity, many of them in good preservation, and many others tolerably well restored by boiling in gelatin. All show considerable artistic merit and mastery of the material.

Solomon had an ivory throne inlaid with gold—vide description in Chronicles; and the throne of Penelope, of about the same date, is said to have been of ivory and silver. Those ancient carvers attained a delicacy and artistic finish that our modern artists may well envy.

The later Greeks and Romans carried this gold-and-ivory and ebony-and-ivory work to a degree of splendor which seems incredible. From their extensive traffic with Persia and Egypt they obtained immense quantities of both Asiatic and African ivories. The Temple of Juno at Olympia contained, among many great works in ivory, the coffer of Cypselus, the bed, the discus, and the statues of Juno, the Hesperides, and Minerva.

The reputation of the great Phidias was based largely on his gold and ivory sculpture. The Minerva of the Parthenon, forty feet high, and the Olympic Jupiter, fifty-eight feet, evidently surpassed anything of the kind known to moderns. The pupils of Phidias made a number of those colossal images, in which the nude parts of the human figure were in ivory and the drapery in gold.

The Romans were equally extravagant; the gates of the Temple of Appollo, built by Augustus, were of this costly material. Charlemagne had two ivory gates of Byzantine workmanship. The episcopal chair of St. Vitalis, a work of the sixth century, is a fine specimen. Ivory seems to have become scarce in the twelfth century, and bone was largely used for carving, but during the middle ages ivory again became plentiful, and with the renaissance the art of carving reached perfection.

Florence, Flanders, and Germany were great centers. Cellini, Michael Angelo, Raphael, Dürer, and others tried the old-new art. In the seventeenth century there were many celebrated ivorists. Monks in cloisters frequently devoted a life to carving a crucifix. There are several specimens in different museums.

Schliemann, in his excavations at the supposed site of Troy, found many articles of ivory, useful and ornamental. The French town of Dieppe has had celebrated ivory factories since the fifteenth century, and is still extensively in the trade; but it is in the East, and especially in China, that ivory is most highly prized and worked into decorative forms.

No amount of care and patience is considered excessive among the Chinese in this work of ivory cutting. This is evident in the extremely minute and delicate workmanship of their carved, lace-like trays, while their nests of concentric ivory balls are well known and are reckoned among the puzzles of industry.

The earliest recorded history—we might say prehistoric, the hieroglyphical—that has come down to us has been in carvings on ivory and bone. Long before metallurgy was known among the prehistoric races, carvings on reindeer horn and mammoth tusk, evidence the antiquity of the art. Fragments of horn and ivory, engraved with excellent pictures of animals, have been found in caves and beds of rivers and lakes. There are specimens in the British Museum, also in the Louvre, of the Egyptian skill in ivory carving, attributed to the age of Moses. In the latter collection are chairs or seats of the sixteenth century, B. C., inlaid with ivory, and other pieces of the eleventh century, B. C. We have already referred to the Nineveh ivories. Carving of the "precious substance" was extensively carried on at Constantinople during the middle ages. Combs, caskets, horns, boxes, etc., of carved ivory and bone, often set in precious stones, of the old Roman and Anglo-Saxon periods, are frequently found in tombs. Crucifixes and images of the Virgin and saints made in that age are often graceful and beautiful. The Chinese and Japanese are rival artists now in their peculiar minutiæ and detail.

Nothing is wasted in manipulating ivory; all dust, shavings, chips, and small pieces are utilized by being converted into gelatin, or ivory black, or artists' pigments; confectioners and chefs make use of ivory dust. Owing to the constantly increasing price, many attempts have been made to imitate ivory, but with poor success. Billiard balls and other small articles have been made of celluloid, a combination of gun cotton, camphor, and ivory dust, but none have been satisfactory to the workman, whether carver, turner or miniature painter.

There are not less than fourteen extinct but only two or three living species of elephants. Like the American buffalo, they are becoming less numerous every year. Though long-lived, some have in captivity lived over one hundred and fifty years, they propagate very slowly, the most slowly of any known animal; the period of gestation is twenty-two months, and but one at a birth, and they are gradually disappearing before the hunter. One writer states that England's imports of African ivory alone average in one year 15,550 hundredweight, worth from £600,000 to £750,000, or between three and four million dollars, and predicts the certain decrease of supply and consequent increase of value of ivory. (Popular Science Monthly.)

——A Chicago company has been incorporated for trading in all commodities in the Klondike region and one of its first ventures is to be a stock of drugs which will be sent out in charge of Dr. M. C. Billings.

(Special Correspondence.)

A WINTER IN THE ETERNAL CITY.

By AN ENGLISH MINOR MAN.

It was not many months after passing my examination at Bloomsbury Square that I heard through a friend of a vacancy in a first-class pharmacy at Rome, where an English assistant is employed during the winter season only. I had never been on the continent and the offer looked all right, 200 lire ($40) per month, and 150 lire ($30) towards my traveling expenses there and back. I found out later on that in Italy every pound of baggage has to be paid for, and that my second-class fare from London to Rome and back came to about $60, but one always buys one's experience.

A Roman Pharmacy.

The shop itself impressed me a good deal. A lofty painted ceiling and handsome tiled floor, hanging glass chandeliers, marble-topped counter, and sponge case to match, mirror-backed fittings, and the most elegant and expensive toilet requisites in the counter cases. All the bottles were kept in cases, and some of them merely contained colored water; in fact, many details were arranged more for show than use. In the windows were the usual carboy and the leading English and foreign patents.

And while speaking of exteriors, I must mention a very handsome façade I noticed in a small street leading out of the Corso (Bocca di Leone). This house, known as the "Farmacia Sinimberghi, has the spaces between the upper windows decorated with well designed painted figures, representing Pharmacy, Medicine, Chemistry and Botany; Hippocrates, Galen, Volta and Linnæus. It is quite unique in its way, and the owner does a good high-class business, I understood.

St. Angelo and St. Peters.

Italian Assistants.

The tourist season had just commenced when I arrived in October, and we were pretty busy until Easter. The other assistants were all Italians, and I noticed the younger ones absented themselves for some hours daily. I understood afterwards that this was to enable them to follow the four years curriculum necessary to obtain a diploma, and which seemed to entail a good deal of work and study; but they did not dread the examinations in the same way as we do. A qualified man usually earned from $20 a month, according to his ability and experience.

Dispensing (English and Italian)

was my regular work. Besides prescriptions from most of the ten or eleven English speaking doctors in Rome—of whom three or four, by the way, are Germans—there were numerous others from all countries.

These often dated from years back, were of that class that the well-to-do English traveler always seems to take with him—remedies for coughs and such stock ailments, sleeping draughts, tonics, etc. We usually charged 2 lire (40 cents) for a 6-ounce mixture and 2½ lire for an 8-ounce.

Three or four doctors (and a chiropodist) each kept a special book at our pharmacy, and looked in twice a day or so to see if any patients had inscribed requests to call. They seemed to keep strictly to prescribing, and left all dispensing to pharmacists; so that both the Italians and myself always had plenty to do. These Italian doctors principally prescribed quinine powders, pills, effervescing lemonade purgatives, and cinchona bark. Their liquid medicines were usually drops, put up in drop bottles, while the powders were invariably enclosed in wafers.

The metric system was obligatory. I soon mastered it, and all prescriptions were written in Italian. But I had a set of apothecaries' weights for my English work.

All these prescriptions were charged low, for the Italians are an economical folk. English chemists grumble about "penny customers"; but in Rome we sold a cent's worth of cough lozenges, glycerine, etc., etc. I have often seen a working man come in with a "soldo" for such articles.

The dispensary was a large, roomy place with the biggest dispensing counter I ever saw—we have no such elbow room in London. A huge marble slab at one end and a sink with constant running water at the other. The water supply of Rome has been famous ever since ancient times, and is still one of the finest in Europe.

A Dangerous Custom.

I thought, was the practice of fetching lotions and external medicines in those picturesque strawbound wine flasks so familiar to tourists. It is impossible to see what a "fiasco" contains, and a fatal mistake might be made if a thirsty man took a surreptitious draught. But I must add I never heard of an accident; I always labeled mine most carefully.

Patents and Prices.

We kept the leading English, American, French and Italian proprietary articles, and sold at full prices. I heard of no cutting among good class pharmacists, though department stores had reduced prices of articles of everyday use. On the contrary—between carriage, duty, and town dues—we had to sell some of the imported goods at nearly double the marked price. The law which forbids the importation of medicines of which the ingredients are not marked on the label is not strictly applied; doubtless the tourists are too profitable folk to be deprived of their favorite panaceas. Some American firms push their articles vigorously, with Italian printed matter and huge posters (I may cite Scott's Emulsion); and Burroughs, Wellcome & Co. had a resident agent in Rome, I was informed.

Our Customers

were a polyglot body as may be imagined. Sometimes I made a mistake, and addressed a Russian in English, for instance; but having colleagues who spoke French and German somehow, we managed to give everybody attention. There were the pilgrims from all countries who came in their thousands to Rome, but do not spend much; the English of all classes, from millionaires to cooks, tourists (and stablemen who came in for veterinary medicines); Americans, mostly of the wealthier class, and consequently some of our best customers; Germans, etc., as well as Italians. We kept side lines for the hotel customers—soap (not supplied by the Italian hotel keeper); good quality brushes, some perfumery—and I may add insect powder had a fairly steady sale. We did a little in mineral waters also.

Embalming

was a new line to me, but one of our Italian assistants was a past master in this ancient art. Every season his

Piazza Colonna.

services were called into requisition, mostly in the case of Americans, for deceased Europeans (living so much nearer) can usually be conveyed home for burial without such precautions. My colleague would leave for the mortuary with litres of bichloride of mercury and unlimited cotton wool, and his cheerful task usually occupied him about half a day. But I fancy the doctor took the lion's share of the fee; as the assistant usually only received from $10 to $20 for an operation which would probably be worth $100.

A Picturesque Ceremony.

also novel to me, was the blessing of the pharmacy by a priest—I forget on what particular occasion. In full canonicals, and assisted by two acolytes, he sprinkled the floor, etc., with holy water; a good deed which was its own reward, for he received no fee of any kind at the time.

Hours, Holidays and Outings.

I worked from 8 a. m. to 10:30 p. m. (9 p. m. twice a week); one afternoon per week I was free, and also every second Sunday. One man slept upstairs for night duty—the bell was seldom rung, he told me—but the rest of us lived outside. My room, overlooking the Corso and Piazza Colonna, large and well furnished, cost me $7 monthly, and was pleasant enough except when the Tramontana wind was blowing, when I would cheerfully have changed the painted ceiling and gorgeous furniture for a stove or fireplace—unknown luxuries in most Roman houses.

I found my spare hours none too numerous, but saw what I could. On free afternoons one could stroll to the Pincio or Villa Borghese; on Sunday we would set off for the hills, Tivoli or Frascati—or for the Campagna.

Or if a comrade knew of a little "osteria" or wayside inn, where the proprietor's vineyard had a local reputation, we would make a pilgrimage there on foot, and our walk, followed by the inevitable game of bowls would sharpen our appetites for the homely but tasty cuisine, and make us declare the hosts' vintage superior to the choicest Chianti.

And although I came back to London no richer than I started, I have never regretted my trip. I found the Italian capital clean, well lighted, interesting, and healthy (the death rate two points below London, and "Roman fever" principally talked about by tourists with bad colds) the life pleasant, the people sociable, the business experience varied and useful, and full of new ideas. So that my winter in Rome was a pleasant break in our necessarily monotonous business life.

We are in receipt of a copy of the first publication of "Annuaire Medical et Pharmaceutique Lorrain," issued at Nancy, France. The work is quite pretentious and unlike anything of its kind published in this country, as it combines the catalogues of the schools of that section with a directory of pharmacists and digest of medical laws. The pamphlet gives a list of the faculties of the schools of medicine and pharmacy of the University of Nancy, requirements for graduation, a description of the hospitals, the officers of the boards of health of the various arrondissements, list of practicing physicians and pharmacists, and extracts from the laws relating to medical and pharmaceutical practice.

TO FIND OUT IF A ROOM IS DAMP.—A kilogram of fresh lime should be placed therein, after hermetically closing doors and windows. In twenty-four hours it should be weighed, and if the kilogram has absorbed more than ten grams of water (that is, more than one per cent.) the room should be considered damp and classed as unhealthy. The question of the dampness of dwellings is a frequent cause of dispute between landlord and tenant, and is naturally solved in the negative by the former. The question can be settled in the future by the test of the hydration of lime, which will give irrefutable proof of the validity of such complaint.

DANGEROUS INKS.—The London Lancet (Sci. Amer.) calls attention to the serious injuries which sometimes result from an apparently trifling scratch or puncture made with the pen. The chemical constituents of the ink which is introduced by the pen into the wound are not capable of producing septicæmia, but microscopic examination proves that the ill effects are due to the liability of ink to contain pathogenic bacteria. Dr. Marpmann, of Leipsic, has recently published the results of the microscopic examination of sixty-seven samples of ink used in schools. Most of them were made with gall nuts, and contained saprophytes, bacteria and micrococci. Nigrosin ink, taken from a freshly opened bottle, was found to contain both saprophytes and bacteria. Red and blue ink also yielded numerous bacteria. In two instances Dr. Marpmann succeeded in cultivating from nigrosin ink a bacillus which proved fatal to mice within four days. This ink had stood in an open bottle for three months, and the inference to be drawn from the inquiry is that ink used in schools should always be kept covered when not in use. The practice of moistening the pen with the tongue is likewise a dangerous one.

A Perplexing Matter.—At a foreign court.

Judge (to witness)—"What is your name?"

Witness—"Thomas Bells."

"Your age?"

"To tell you the truth, your honor, I don't know."

"Strange; so young a man and so forgetful. Are you married?"

"Yes, sir."

"How long since?"

"Three years."

"How old were you then?"

"Nineteen."

"Are you sure?"

"Yes, sir, sure."

"Then how old are you now?"

Witness (near tears).—"I told your honor I couldn't remember."

QUESTION BOX

The object of this department is to furnish our subscribers and their clerks with reliable and tried formulas and to discuss questions relating to practical pharmacy, prescription work, dispensing difficulties, etc.

Requests for information are not acknowledged by mail and ANONYMOUS COMMUNICATIONS RECEIVE NO ATTENTION; neither do we answer queries in this department from non-subscribers.

Phosphorus Rat Pastes.

(C. S.) See Era Aug. 12, 1897, page 207.

Tasteless Syrup Quinine

(C. D. C.) See Jan. 7 and 21, 1897, issues of this journal, pages 15 and 78, respectively.

Violet Ammonia for Toilet Use.

(A. J.) See this journal, July 8, 1897, page 46. Color green with a suitable aniline.

Castoria.

(C. J. C.) See issues of this journal, this year, Jan. 7, page 20, and Jan. 14, pages 50 and 57.

Official and Officinal.

(K. P. S.) The distinction between these terms is given in the lecture of the Era Course in Pharmacy, to appear in this journal next week. All preparations made by pharmacopœial methods are properly called "official."

Hair Dyes.

(S. J.) We cannot give the formulas for proprietary articles. Our best information regarding brown hair dyes was given in this journal, May 5, 1897, page 176. Why not do a little experimenting with the formulas and suggestions there outlined.

Potassium Iodide and Ammonium Muriate.

(D. & Z.) ask if potassium iodide is incompatible with ammonium muriate in the following prescription:

Ammonium muriate	1 dram
Potassium iodide	½ ounce
Tincture opium, camphorated	½ ounce
Syrup wild cherry	2 ounces
Syrup tolu	2 ounces
Water, q. s., to	6 ounces

No. Potassium iodide and ammonium muriate may be safely dispensed together. In this prescription, however, potassium iodide will cause precipitation of some of the constituents of camphorated tincture of opium and syrup of wild cherry.

Magnesia as an Excipient.

(A. R. L.) submits the following prescription:

Creolin	1 dram
Dover's powder	1 dram
Magnesium carbonate	½ dram

Mix and make into 12 capsules.

He wishes to know if the magnesium carbonate will make an objectionable mass. Will the mass be insoluble in the stomach? On general principles magnesium carbonate should be used very cautiously in the preparation of pill masses of this character, for it has a tendency, especially if too much be used, to form the mass into a very hard cement-like body, which is practically insoluble. Scoville in his investigations of this subject says ("Art of Compounding") that magnesia is the most efficient excipient, and the most objectionable, and it should never be used except as a last resort.

Chemicals.

(T. B. T.) Chemicals are substances of definite chemical composition. Thus in the question asked by the Oklahoma Board of Pharmacy (this journal, July 29, 1897, page 140), "Name five chemicals that you would label poison, and give properties," you might safely answer: Arsenous acid, corrosive sublimate, potassium cyanide, hydrocyanic acid and sulphate of zinc. All of these substances are of definite chemical composition in contradistinction to the preparations of aconite, belladonna, cantharides, etc., and other galenicals made by methods which do not include any chemical changes or reactions. There are a number of other chemical substances besides those mentioned above, which are named in the law governing the sale of poisons in Oklahoma. The properties of these substances you can find described under their various headings in the dispensatories.

Blackberry Brandy.

(C. J. C.) Here are two formulas:

(1) To 10 gallons blackberry juice and 25 gallons spirit, 40 above proof, add 1 dram each of oil of cloves and oil of cinnamon dissolved in 95 per cent. alcohol, and 12 pounds white sugar dissolved in 6 gallons water. Dissolve the oils separately in ½ pint 95 per cent. alcohol; mix both together, and use one-half the quantity; if the cordial is not sufficiently flavored, use the balance.

(2) One-quarter ounce each of cinnamon, cloves, and mace, 1 dram of cardamom. Grind to a coarse powder; add to 16 pounds of blackberries, mashed, and 5 gallons of 95 per cent. alcohol. Macerate for two weeks; press; then add 10 pounds of sugar, dissolved in 3¾ gallons of water. Filter. This product is sometimes diluted with water or a mixture of alcohol and water to lessen the cost. But why use either of these preparations when you have access to the National Formulary, which gives a reliable formula for "blackberry cordial?"

Remedy for Nervousness.

(W. T.) See this journal, Jan. 28, 1897, page 110. Here are two formulas for "Nerve Tonic":

(1)	Tincture cinchona compound	2 ounces
	Tincture lavender compound	2 ounces
	Fluid extract coca leaves	2 ounces
	Fluid extract damiana	2 ounces
	Port wine	8 ounces
(2)	Coca, ground	16 ounces
	Damiana, ground	16 ounces
	Orange peel, ground	8 ounces
	Quassia, ground	½ dram
	Potassium bromide	4 ounces
	Alcohol	32 ounces
	Glycerin	16 ounces
	Water	64 ounces
	Sherry or port wine, enough to make	1 gallon

Macerate and percolate the crude drugs with 32 ounces of alcohol and 32 ounces of water mixed—afterwards with the other 32 ounces of water; in this dissolve the potassium bromide; mix with the glycerin and add to the percolate and enough wine to make up to 1 gallon (Griffith).

Bluing Gun Barrels.

(W. L. B.) (1) For bluing by staining: Dissolve 4½ ounces hyposulphite of sodium and 1¼ ounces lead acetate each in 1 quart of water. Mix the two solutions and bring to a boil in a porcelain dish or stone pot. Clean the gun barrel free from grease, oil or varnish, and, after warming, smear it with the hot solution, using for the purpose a piece of sponge tied to a stick. When the color develops wash the barrel and wipe dry, then finish with boiled linseed oil.

(2) The bluing may be effected by heating in a muffle until the desired blue color is raised, the barrel being first made clean and bright with emery cloth, leaving no marks of grease or dirt upon the metal when the bluing takes place, and then allow to cool in the air. It requires considerable experience to obtain an even, clear blue.

(3) Bluing steel: Scour with a strong aqueous solution of soda, rinse in water, warm, and brush over with a solution of ¼ ounce chloride of iron dissolved in 5 ounces of water, and let dry; then apply in the same manner a solution of one-fifth ounce pyrogallic acid in 1 ounce of

water, dry, and brush. This application does not wear well without lacquering. The blue oxide is sometimes imitated by using a thin alcoholic shellac varnish, colored with aniline blue or Prussian blue.

Removing India Ink from the Skin.

(I. L. M.) Various methods have been suggested for the removal of tattoo marks from the skin. Dr. Variot pours on the marked spot a concentrated solution of tannin, and works it into the skin by a series of pricks, just as in tattooing proper. A certain quantity of tannin is thus introduced beneath the skin. He then rubs the part with nitrate of silver and allows the solution of the salt to remain in situ until the prick marks show out as black points. The caustic is then wiped off, and the result is the formation of a black stain of tannate of silver. Inflammation is set up, and in the course of a fortnight scabs form, on the disappearance of which no trace is left of the original design, the only souvenir being a reddish scar, which in time becomes less visible. Various other plans had been tried without success, scarification, the introduction of opaque powders and caustics into the skin, etc. The tannin, in his operation, acts as a mordant, and in no case did he have to deal with troublesome suppuration, although if the area be large it is well to do a piece at a time.

Another process, recommended by foreign authorities, is this: After asepsis of region the tattoo is remade with a solution of 30 parts of zinc chloride in 40 parts of sterilized water; with due precautions no great inflammatory reaction takes place. After a few days a crust forms, which falls off from the fifth to the tenth day.

Depilatories.

(Pharmacist) No hard and fast lines can be laid down governing the use of depilatories. Success in the removal of hair from any portion of the body depends largely upon the nature of the blemish, and the operation in many cases is far from safe. The principal agents employed are caustics, electricity, and the knife in a minor surgical operation. Probably the best results, as a whole, are obtained from the use of the electric needle, and there are in all our large cities people who make a specialty of this form of treatment. For large blemishes, like hairy moles, etc., the advice of a competent physician should be sought, for frequently dangerous hemorrhages ensue from attempts to remove these blemishes. A very efficient caustic paste is the following, which eats or dissolves the hair itself, but does not destroy the hair glands, and must be applied as frequently as the growth of the hair renders necessary:

Powdered quicklime, sulphide of barium and starch, equal parts.

The powder is first moistened with a little water and made into a paste and then applied. It acts in a very few minutes, and is then removed by scraping with a paper knife or smaller blunt instrument. The skin is well washed with water and an emollient applied. A depilatory long used in the Orient consists of one part orpiment and six parts of lime slaked to a powder. The ingredients are intimately mixed by passing them through a sieve. For use, it is made into paste with water, similarly to that given above, and applied. It is very energetic, and its use is not advised.

Liquid Depilatory.

Here is a formula from Monatschr. für Dermatologie and recommended by Dr. Butte:

Alcohol	12.00 grams
Iodine	0.75 grams
Collodion	35.00 grams
Oil turpentine	1.50 grams
Castor oil	2.00 grams

Apply to the part from which the hair is to be removed once or twice daily for three or four successive days, increasing from day to day the thickness of the layer. Before applying this or any other application we suggest you consider well the above remarks.

For some other formulas see a recent issue of this journal (July 29) page 144.

Hair Grower.

(A. J. T.) Most of the preparations recommended for this purpose contain cantharides. Sometimes fluid extract of jaborandi is added to stimulate the growth. Of course, if the hair bulbs are destroyed or badly diseased a stimulating wash or application is not of much service.

Here are some formulas:

(1) Ammonium carbonate	30 grains
Distilled water	10 drams
Tincture cantharides	2½ drams
Eau de cologne	10 drams
Rum	7½ ounces
Oil of lavender	2 drops

Dissolve the ammonium carbonate in the water, mix the other ingredients together, and add.

(2) Quinine sulphate	20 grains
Tincture cantharides	2 fl. drams
Fluid extract jaborandi	2 fl. drams
Alcohol	2 fl. ounces
Glycerin	2 fl. ounces
Bay rum	6 fl. ounces
Rose water, enough to make	16 fl. ounces

Dissolve the quinine in the alcoholic liquids, add the other ingredients and filter.

Hager is authority for this one:

(3) Tincture cantharides	1 gram
Oleo-balsamic mixture (N. F.)	50 grams
Tannic acid	5 grams
Rose water	50 grams
Alcohol,	
Glycerin, of each	100 grams

Make a solution and filter.

Many formulas similar in character have been published in previous volumes of the Era. Consult the indexes.

Manufacture of Dry Plates.

(H. G. B.) Dry plates for photographers are now manufactured in such large quantities that it is rarely beneficial so far as cost is concerned for the amateur to attempt to manufacture his own. However, from the Encyclopædic Dictionary of Photography we abstract the following method of preparing dry plates by hand:

It is first necessary to prepare an emulsion of bromide of silver or other gelatine emulsion for coating the glass plates. Here is one formula:

(1) Potassium iodide	10 grains
(2) Potassium bromide	272 grains
(3) Nelson's No. 1 photographic gelatine	60 grains
(4) Silver nitrate	350 grains
(5) Hard gelatine	1 ounce

Nos. 3 and 5 are rapidly washed in water by pouring some on and draining it off again as soon as possible without allowing it to soak up much water, but merely to get rid of any adherent dust.

In two small test tubes place Nos. 1 and 2, and add 3 ounces of water to each. To No. 2 add 2 minims of strong hydrochloric acid, together with sufficient of a solution of iodine in alcohol to turn it a deep sherry color. The gelatine No. 3 is then placed in two ounces of water, and when it is properly swollen it should be dissolved No. 4 is dissolved in an ounce of water, and heated to about 120° F. The different solutions are now removed to the dark room. The gelatine No. 3 is placed in a jar standing in a pan of hot water, and No. 4 added to it. The whole is then shaken up and thoroughly mixed. Three quarters of the bromide solution No. 2 is then added very slowly, violently stirring the whole time. No. 1 is then added to the remaining portion of No. 2, and the mixture added to the emulsion now formed. The addition of the bromide to the silvered gelatine is not to be done carelessly, and the mixing process must be thoroughly done. A small drop of the emulsion should next be placed on a piece of glass, and should appear of a ruby color, when examined by gaslight looking through it. The pan containing the jar with the emulsion is now carefully heated, and the emulsion boiled for about three-fourths of an hour, the jar being frequently shaken. When boiled the required length of time, the pan is removed. The hard gelatine No. 5 is now placed in 4 ounces of water, allowed to swell, and dissolved at a temperature of about 100° on a water bath. The emulsion and gelatine solution are then cooled to about 70° F. and mixed by thorough shaking. When the froth produced has subsided the emulsion is poured out into a flat porcelain dish and set aside in a dark place to set, which should require about one hour in winter and two or three in summer. The emulsion is now carefully scraped from the dish and squeezed through a netting into water, which breaks it up into little strips and allows the water to dissolve the soluble salts from the emulsion. It is then thoroughly washed, drained, melted, and transferred to a jar, when it is again melted on the water bath, a half grain of chrome alum and six drams of absolute alcohol added, and it is ready for filtering, an operation which is usually conducted with chamois as the filtering medium. It is now ready for coating the plate.

The plates are first cleaned by immersion in nitric acid and then rubbed with caustic soda and a little alcohol, after which they are set up on blotting paper to dry. One by one they are then placed on a suitable holder and the emulsion applied, care being taken that no air bubbles are formed. A plate 8½ by 6½ inches requires about 3 drams of emulsion. After coating the plates are placed in a cool place, and the coating allowed to set, when they are transferred to the drying box or cupboard. For commercial purposes the process of preparing dry plates by hand would be too expensive and tedious. Machinery has, therefore, been devised by which the manufacturer is enabled to coat these plates at the rate of several thousands per day.

Liquor Ferro-Mangani Peptonati.

(J. H. P.) The following is Dieterich's formula:

(1) Citric acid	10	parts
Dissolve in		
Distilled water	50	parts
and neutralize with		
Solution of ammonia, (Liquoris ammonii caustici, P. G.) q. s., or about	20	parts

On the other hand, take

Iron peptonate	24	parts
and bring it into solution by careful boiling with		
Distilled water	150	parts

Add to the hot liquid the ammonium citrate solution, then a solution of

Manganese chloride (crys. and purified) ($MnCl_2 + 4H_2O$)	3.7	parts
Distilled water	10	parts

Then add the following mixture:

Distilled water	500	parts
Cognac	100	parts
Aromatic tincture, P. G.	1.5	parts
Tincture Ceylon cinnamon	0.75	parts
Tincture vanilla	0.75	parts
Acetic ether	2	drops

Finally, bring the whole up to 1,000 parts by weight with distilled water.

It is important that in making this preparation the foregoing proportions be strictly adhered to. If, for instance, the iron peptonate be dissolved in a larger quantity of water there is produced, upon the addition of either the ammonium citrate, or the manganese chloride solution, a precipitate which is only redissolved by further heating. The liquor so obtained is described as being of a dark red color, somewhat turbid looking in reflected light, but clear in transmitted light. It contains 0.6 per cent. of iron and 0.1 per cent. of manganese.

Here is another one recommended by the Berlin Apothecaries' Society:

(2) Iron peptonate (25 per cent. iron)	24.0	grams
Liquor manganese glucosate (2 per cent. manganese)	50.0	grams
Solution soda, sp. gr. 1.170	10.0	grams
Syrup	200.0	grams
Alcohol, 90 per cent	100.0	grams
Tincture orange	3.0	grams
Aromatic tincture	1.5	grams
Tincture vanilla	1.5	grams
Acetic ether	5	drops
Distilled water, enough.		

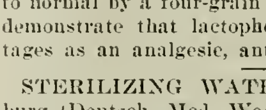
Dissolve the iron peptonate in 200 grams hot water; allow to cool, then add first the syrup, soda solution, and then 90 grams distilled water, whereby the precipitate, previously formed, is redissolved. To the manganese glucosate add a few drops of solution soda, to render faintly but distinctly alkaline, and add this to the preceding solution. Finally add 320 grams of distilled water, then the alcohol, and lastly the flavors. This preparation contains 0.6 per cent. of metallic iron and 0.1 per cent. manganese. Its reaction is alkaline.

See also this journal, Oct. 17, 1895, page 496.

COCOA AND CHOCOLATE.—The difference between these two commodities has been the subject of an opinion rendered by one of the general appraisers of the customs service. Here is what he says: Prepared cocoa consists simply of the ground nibs of the kernel of the Theobroma cacao, in the form of powder, paste or cake, while chocolate is produced from the same substance and by similar processes, but with the further addition of sugar and flavoring matters.

LACTOPHENIN AS ANALGESIC AND ANTIPYRETIC.—In the Alabama Med. & Surg. Age, Dr. C. M. Watson reports two cases where lactophenin was used with good result. One was a very severe case of dysentery, in which 8 grains of lactophenin effectually counteracted the fever, restlessness, thirst, insomnia and pain. In the other, a temperature of 104° was reduced to normal by a four-grain dose. Practical trial seems to demonstrate that lactophenin has very decided advantages as an analgesic, antipyretic and sedative.

STERILIZING WATER BY BROMINE.—Schumburg (Deutsch. Med. Woch., Sc. Am.) describes a new method of sterilizing water by the use of bromine, one grain being sufficient to destroy all the bacteria in one quart of water, the bromine afterward being neutralized by ammonia, so that a clear and tasteless water is obtained. For this purpose a twenty per cent. solution of bromo-bromiodide (bromiodide, one part; bromine, one part; water, five parts), is used. Thirty minims of this solution are sufficient to sterilize in five minutes one quart of river water. If the water is very hard or very foul, the lime salts and the ammonia contained in it neutralize a part of the bromine, and in such cases it is necessary to add the bromine solution until a faint yellow color is obtained and persists for at least half a minute. An equal quantity of a nine per cent. solution of ammonia suffices to neutralize the free bromine. It is desirable that these amounts should exactly correspond, although a faint taste either of bromine or of ammonia is not objectionable. When the bromine is exactly neutralized, the water is clear and can scarcely be distinguished from the original water, while the amount of bromine salt which it contains is so small that it has no effect upon the system. This method bids likely to be of especial use in times of epidemics, in war, etc.



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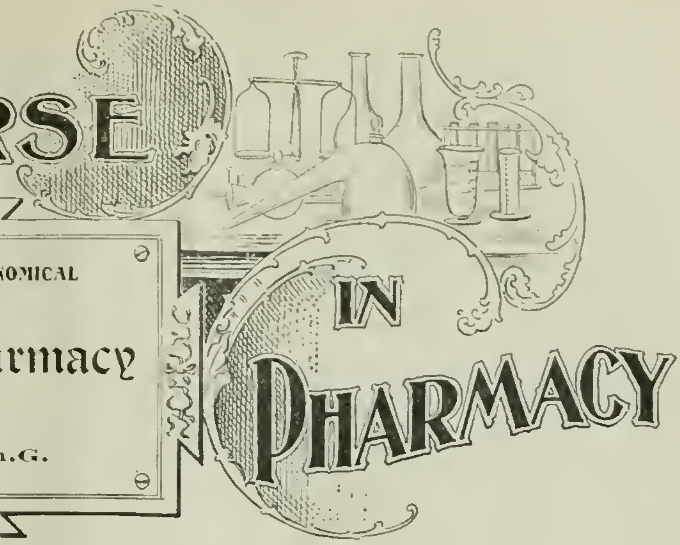
(See page 19.)

THE ERA COURSE IN PHARMACY



A PRACTICAL, THOROUGH and ECONOMICAL
COURSE OF
Home Study in Pharmacy
UNDER THE DIRECTION OF
J. H. BEAL, Sc.D., Ph.G.

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LECTURE NO. I.

The Relation of Pharmacy to the Science of Medicine.

Classification of Pharmaceutical Branches, Dispensatories.

The Relation of Science and Art.—A Science consists of the exact and systematic statement of the knowledge concerning some subject, or group of subjects, as obtained by observation and verified by experiment. An Art is the practical application of knowledge to the attainment of some desired end.

The difference between a science and an art is the difference between something to be known and something to be done; pure science finds its expression in the exact statement of facts and principles, while an art is manifested by the accomplishment of practical results. It is through the advancement of science that the arts are perfected, and it is the attainment of practical ends that must ever remain as the chief incentive to scientific research. It is owing to this intimate connection of their parts that when a particular branch of science is spoken of its practical application in the arts is understood to be included, and it is in this sense that the term will be used here.

The Medical Science.—In its broadest sense, Medicine is the science and art of preventing or curing disease or injury in the animal organism. Considered in this sense, it includes every branch of knowledge which relates either to the preparation of remedies, their application to the prevention or cure of disease, to the correction of deformity, or to the repair of injury.

Owing to the vastness of the science as a whole, and the consequent inability of any one person to acquire an adequate knowledge of the entire subject, it is customary to consider it under several special heads or subdivisions, known collectively as the medical sciences.

Of the various recognized subdivisions it will be sufficient for the present purpose to consider only the following:

Pathology, or the science of morbid physiological conditions, or of the cause, nature and phenomena of disease.

Therapeutics, or the branch of medical science which considers the application of remedies to the cure of disease.

Materia Medica, or the science which treats of the nature and properties of the materials used in medicine.

Surgery, or the science and art of treatment through mechanical means, or by manual operations.

The practical application of the preceding sciences, and of some closely allied branches, to the treatment of disease or injury in the human subject is popularly comprehended under the title of the "Practice of Medicine," or when applied to the treatment of the animal subject, as "Veterinary Medicine and Surgery." The special subdivision which confines itself to the treatment of diseases or deformity of the teeth is known as Dental Surgery and Medicine, or more commonly as "Dentistry."

PHARMACY.

All of the preceding may be classed together as the Applicative branches of medicine, since they are intimately concerned with the immediate application of means to the cure of disease. Since the applicative branches are incapable of attaining the highest degree of efficiency without the aid of proper materials and appliances, and since they are capable to only a limited extent of supplying themselves with these materials, there is rendered necessary the existence of a separate branch for that purpose. This separate branch is known as Pharmacy, which may be defined as the Science and Art of Preparative Medicine, and in its broadest sense will include a consideration of all that pertains to the preparation and supply of the materials employed by the physician and surgeon, the dentist or the veterinarian.

In theory, the applicative branches are concerned with the diagnosis of disease, and the application of the proper treatment therefor: the preparative branch has nothing to do with the diagnosis of disease, nor with the application of remedies, but is concerned solely with the preparation and supply of the materials used by the applicative branches.

Unfortunately, while it is thus possible to make a perfect separation of the medical sciences in theory, it has not hitherto been found possible to entirely separate them in practice. Owing to the imperfect state of education in both medicine and pharmacy, and more especially to the lack of well-informed public opinion, the encroachments of the several branches upon each other have been greater than is justified by either public or by professional interest.

Properly understood, the practice of medicine and pharmacy as branches of medicine are the necessary complements of each other. They have many interests in common, and whatever advances or retards the prosperity of one, eventually operates equally to the advantage or disadvantage of the other.

The Subdivisions of Pharmacy.—Like nearly all sciences which have a practical application, pharmacy is a composite subject, and more or less debtor to nearly all other branches of human knowledge. Physics, Chemistry and Botany, however, are the sciences which have contributed the most of its subject matter.

To the first it is indebted for a knowledge of the physical laws which govern its operations, to Chemistry for a knowledge of the composition of the substances with which it deals and of the changes of composition which take place in them, and to Botany for many of its most important materials. But it is not sufficient to be familiar with the general sciences of chemistry, physics and botany in order to be a pharmacist. Each of these subjects must be studied with respect to their special applications to pharmaceutical purposes. For this reason it is usual to pursue the study of pharmacy under several distinct heads or subdivisions, each of which deals with a particular class of facts of pharmaceutical importance. Some of the more important of these subdivisions are as follows:

Theory and Practice of Pharmacy, under which head it is usual to consider the special application of physical laws and processes to pharmaceutical operations.

Materia Medica, which treats of the nature and properties of the substances used in medicine, with its special subdivision, Pharmacognosy, or Pharmacognosis, which particularly concerns itself with the characters and identification of crude drugs.

Microscopy, or the science of the use and application of the microscope.

Toxicology, or the science which treats of poisons and of the methods employed in their analysis and detection.

In addition to these there are numerous other subjects of study necessary to the acquirement of an education in pharmacy, and which will receive mention later on.

Pharmacopœias.—A Pharmacopœia is work issued by some recognized pharmaceutical or medical authority, defining the characters, and prescribing the purity, strength, and methods of preparing the principal medicines.

The purpose of a pharmacopœia is to insure uniformity in the character and activity of medicines wherever they may be ordered or produced. The principal civilized nations of the world have each its own pharmacopœia, which is the standard of pharmaceutical practice within the territorial limits of their respective governments.

The Pharmacopœia of the United States differs from most others in that it is not issued by the government, but by a committee of physicians and pharmacists, selected from a body of delegates representing the various Colleges of Medicine and Pharmacy, and the Medical and Pharmaceutical Societies of the United States. It represents very fairly the general consensus of medical opinion of the United States, but has no legal sanction or authority, except in so far as its merits have led to its adoption as a standard by several State Governments, and by the various departments of the Federal Government.

The convention of delegates which selects the Committee of Revision meets at Washington, D. C., every ten years. The Pharmacopœia of 1890, which is the seventh decennial revision, was issued in the latter part of 1893, and went into effect on the first day of January, 1894.

Foreign Pharmacopœias.—The foreign pharmacopœias which are of most importance to American pharmacists are as follows:

The British	Pharmacopœia,	last	issue	1885.
" German	"	"	"	1890.
" French	"	"	"	1884.
" Mexican	"	"	"	1884.
" Swedish	"	"	"	1879.
" Norwegian	"	"	"	1893.

International Pharmacopœia.—It is believed that the benefits realized by the existence of the several national pharmacopœias would be increased to a large degree by a Pharmacopœia which should serve as a common standard for all civilized countries. Up to the present, however, it has been found impossible to secure sufficient either of financial or of moral support for such a project to make it feasible. At the meeting of the International Congress of Pharmacists at Chicago in 1893 the subject was carefully considered, and a committee composed of eminent pharmacists was appointed to take steps looking toward its realization, the sum of $1,000 having been generously donated for that purpose by the American Pharmaceutical Association, but as yet there is no indication of the early accomplishment of the project.

Official and Unofficial.—Substances and processes which find a place in the Pharmacopœia are known as Official, to distinguish them from those which are Unofficial, or are not so recognized. Whether a substance shall be included in the pharmacopœial list or not rests wholly within the discretion of the Convention and Committee of Revision.

It must not be presumed that a substance is of no importance because it is not included in the official list, since many articles of undoubted importance in pharmacy and medicine are, for various reasons, not so included. The term "official" is thus seen to be synonymous with "pharmacopœial," but is more frequently used as a shorter and more convenient word.

The nearly allied word *officinal* is often misunderstood to be synonymous with official. The former term is derived from the Latin *officina* meaning a shop. Properly, officinal substances are those to be found in the shops of pharmacists, whether they are official or not.

Commentaries on the Pharmacopœia.—The prime object of a pharmacopœia being to provide a standard for materials, processes, and products, it is properly restricted to these purposes. The pharmacist must, however, be familiar with not only the pharmacopœial requirements of each drug and preparation, but with its physiological properties as well, with the doses in which it may be safely given, with its natural history, and with many other facts about which the Pharmacopœia cannot legitimately concern itself. The Pharmacopœia is necessarily restricted to drugs and processes which have a recognized place in medicine and pharmacy, but many of the articles found on the shelves of the pharmacist are not so recognized, and with the properties of these he must be acquainted, as well as with those which are official. So, also, he should be familiar with the corresponding substances and preparations of other pharmacopœias besides his own. These necessities have given rise to commentaries on the Pharmacopœia, which are generally known as "Dispensatories," "Companions to the Pharmacopœia," etc. The principal American works of this kind are the United States Dispensatory, the National Dispensatory, the American Dispensatory, and the Companion to the Pharmacopœia. These publications are, of course, due to private enterprise, and depend for their sale upon the confidence of the purchaser in the learning and ability of the authors of the respective works. One or more of them should be found in the working library of every pharmacist.

The Subject Matter of Pharmacy.—A careful study of the Pharmacopœia will show that it concerns itself mainly with three different classes of facts: (1) Facts relating to certain Materials which are supplied to pharmacy by nature or by commerce. (2) Facts relating to certain Manipulations or processes which are applied to these natural or commercial products to fit them for use in medicine and pharmacy. (3) Facts relating to certain products which result from the application of the pharmaceutical processes to the pharmaceutical materials. Therefore, taking the Pharmacopœia as the basis of study, it will be seen that the subject-matter of pharmacy naturally divides itself into three principal divisions as follows:

(1) Pharmaceutical Materials.
(2) " Processes.
(3) " Products.

By adhering to the foregoing classification of its subject-matter, it is possible to develop the Theory and Art of Pharmacy in as systematic and logical a manner as is possible in any science which must meet the practical requirements of every-day life.

Naturally it would seem more logical to take up the study of the subject-matter of pharmacy in the order in which it has been classified. Practically, however, and in deference to an almost universal custom, it will be found more convenient to consider first the Processes, afterwards the Materials, and finally the Products of Pharmacy. But before entering upon the consideration of either of these subdivisions, it will be more profitable to take up the study of the three fundamental sciences upon which pharmacy is based, as Chemistry, Physics and Botany.

Lectures on Physics and Chemistry.

INTRODUCTORY.

The students who present themselves for matriculation at colleges of pharmacy are commonly very poorly trained in the elementary principles of physics. Even those who come with certificates from high school are frequently found deficient in a knowledge of the common properties and laws of matter and energy.

The result of this lack of training is both to hamper the instructor in his presentation of pharmaceutical processes depending on physical laws and to handicap the student in his comprehension of them. Either the lecturer must frequently turn aside from the subject in hand to supply information that should have been acquired before entering upon the college course, or else deliver his lectures with the painful consciousness that to at least a portion of his audience the significance of much that he says is not apparent.

It is this fact which has suggested the following brief course of lectures upon elementary physics, as a preliminary to the more technical studies which are to be considered later. There will be no attempt to present anything like a full statement of the science in its modern form. The discussion will be confined closely to such matters as have a more or less direct bearing upon pharmaceutical questions. Many important divisions of the general science will either be passed entirely over, or be given but scant treatment.

In both Physics and Chemistry the aim has been to give such a statement of fundamental principles as would be intelligible to the class of students for whom these lectures are primarily intended. This fact may account for the omission of a discussion of some of the later developments of experimental science, as well as for the comparatively large share of attention devoted to the so-called properties of matter and to similar subjects. For a like reason some liberties of statement have occasionally been indulged in, the writer preferring to be understood by the student than to be technically correct, believing it to be more advisable to omit an occasional qualifying statement than to attempt a complete exposition of obscure points at such an early stage of the student's course.

In the selection of experiments for the "Practical Studies," it has been remembered that the majority of the students who pursue this work will be limited in the range of materials and apparatus at hand, and in the opportunities for personal instruction. Accordingly the experiments assigned are such as may be performed with a minimum of resources, on the principle that simple experiments actually performed will have greater educational value than more elaborate ones which from force of circumstances must be neglected.

The relatively large amount of space which is devoted to the subject of Chemical Notation and Equation Writing is due to the importance of that subject in the subsequent studies in Chemical and Pharmaceutical Arithmetic. Under different circumstances some question might arise as to the wisdom of beginning a course in chemistry by a discussion of nomenclature and equations, but it is believed that this method is adapted to the conditions under which the lectures must be given.

LECTURE NO. 2.

Pharmaceutical Physics.

Originally the term Physics, or "Natural Philosophy," was understood in nearly the same sense as the modern term "Natural Science," and referred to the study of nature in all its departments. With the increase in knowledge concerning the different classes of natural objects and of natural phenomena it became necessary to make a subdivision of so vast a subject, and so the different departments of Biology, Chemistry, Astronomy, and Geology have been split off one by one and have themselves attained to the dignity of separate sciences. What was left from this subdivision of the old natural philosophy, as developed by modern research, constitutes the present science of Physics, and is best defined in terms of its subject matter as the "science of matter and energy."

Relation to the Other Sciences.—Though studied as separate branches of science, the several subjects named above are by no means independent of physics. In conjunction with chemistry, physics forms the basis upon which every other branch of natural science rests; while between physics and chemistry the connection is so close that it is sometimes difficult to determine where the province of one ends or that of the other begins. Perhaps the best distinction is that, while chemistry is mainly concerned with the change in properties caused by chemical action, physics is concerned only with the transferences and transformations of energy, without regard to any changes in properties which may be produced. While every chemical action involves a physical change, many physical changes are entirely independent of chemical phenomena.

Pharmaceutical Physics.—By the term Pharmaceutical Physics is not meant a new kind of physics, but a study of physics in its relation to the theory and art of pharmacy. Such physical laws and phenomena as are of especial importance in pharmacy will be emphasized, and their pharmaceutical applications pointed out; such departments of general physics as have but little or no connection with pharmacy will either be touched upon lightly or passed over without mention.

Matter.—If we trace up any of the phenomena which come into consciousness through the bodily senses we shall find them always closely associated with something which is called Matter. For this reason matter has been defined as "anything that is perceived by the senses," but this definition is open to the objection that such things as light, heat and electricity, though perceived through the senses, are certainly not kinds of matter. For this reason it is perhaps better to define matter in terms of its properties.

Among the various properties displayed by matter those of gravitation and dimension are especially prominent. No portion of matter has ever been discovered that is not the subject of gravitative attraction, nor can we conceive of matter which would not occupy space. We may therefore assume that gravitation and extension are universal and essential properties, and define matter as *that which occupies space and exhibits gravitative attraction.*

Mass, Substance, Body.—As these three terms will be frequently employed in the subsequent lectures, it is important that the student should have a clear understanding of their meaning. Mass refers to the *quantity of matter* which a body contains, without regard to its size or form. The term Substance is used to designate some particular *kind of matter* possessed of definite qualities, as iron, clay, wood, stone, etc. A Body is a *definite portion of matter*, as a coin, a lump of coal, or a piece of chalk.

Motion.—The above consideration of matter is without regard to its position in space, or its condition as to rest or motion. A body is at rest when it does not change its position. It is in motion when it changes its position. Since there is no portion of matter in the universe which is either absolutely at rest or in motion with regard to all other portions of matter, these terms, rest and motion, are relative and become intelligible only when understood to refer to some specific point in space. A passenger on a boat is at rest as compared with the boat, and in motion with relation to the banks of the stream.

Force, Energy, Work.—A portion of matter which is in motion will exert a pull upon anything to which it is attached, or a push upon any object placed in its path. This pull or push is denominated *Force*, and may also exist between bodies at rest, as the force of gravitation, the attraction of a magnet, and the like.

If the body pushed or pulled upon is set in motion thereby, *Work* is done upon it, and the pulling or pushing body will lose some of its own motion. This capacity which one body has to do work upon another is called *Energy*.

The essence of work is the transfer of energy, or the production of motion against resistance. Neither the exertion of force without the production of motion, nor motion without resistance is work. If a man should pull upon a boat fast at anchor without moving it, this would be the exertion of force, but not the doing of work upon the boat. If, however, the pull should produce motion, this would be a transfer of energy from the man to the boat and the production of work.

To recapitulate: Force is a tendency to produce or modify motion, and is in the nature of a push or a pull. Force is not energy, but it is the sign or manifestation of energy.

Work is the production of motion against resistance, or the transfer of energy from one body to another. What the body worked upon gains, the working body loses.

Energy is the capacity to perform work, or to set bodies in motion against resistance.

Measurement of Force, Energy and Work.—A Force is measured by the amount of motion it produces, or "Momentum." Momentum is the quantity of motion which a body possesses, and is found by multiplying the mass of a moving body by its velocity. If the mass (M) be 10 pounds, and the velocity (V) be 5 feet per second, the momentum will be $10 \times 5 = 50$. There is no recognized name for the unit of momentum.

Work and energy are measured by multiplying the resistance overcome into the space through which it is overcome. For practical purposes the unit may be either the Foot-Pound or the Kilogrammeter.

The foot-pound is the work done in moving a body through a space of one foot against a resistance of one pound. The kilogrammeter is the work done in moving a body through the space of one meter against a resistance of one kilogram. If a body weighing 10 pounds be lifted 10 feet from the earth, then the work done is $10 \times 10 = 100$ foot-pounds.

If in this example kilograms and meters are substituted for pounds and feet, the product will be 100 kilogrammeters instead of foot-pounds.

Absolute Units.—In purely scientific investigations another set of units known as Absolute Units are used in the measurement of force, energy and work. They are also known as Centimeter-Gram-Second, or C. G. S. units, because derived from the centimeter, gram and second.

The absolute unit of force is the Dyne. It is that amount of force which acting for one second will impart to a mass of one gram, a velocity of one centimeter per second.

The absolute unit for work and energy is the Erg. "An erg is the work done, or the energy imparted, by a force of one dyne working through a distance of one centimeter."

Kinetic and Potential Energy.—As has already been stated, a body in motion possesses energy and is capable of doing work. The energy which it has in consequence of its motion, as a moving car, is denominated Kinetic energy, from *kineo*, to move. Under certain conditions bodies at rest may also be capable of doing work. For example, if a car be pushed up a steep grade, it is capable of doing work when the brakes are loosed. So a clock weight, or a spring under tension, if released, may each perform work. These are examples of energy due to position, or stored up energy. Such energy is known as Potential energy, and exists by virtue of an equivalent amount of work having been previously bestowed upon the body which possesses the advantage of position. The energy of gunpowder, dynamite, etc., are examples of potential energy.

Conservation of Energy.—Perhaps the most important and far reaching generalization in physical science since the enunciation of the law of gravitation by Newton is what is known as the Law of the Conservation of Energy. Stated briefly this law is, That the total amount of energy in the universe is a fixed quantity and can neither be added to nor diminished by any process known to science, and that all varieties of energy are so related to each other that energy of any one kind may be converted into energy of any other kind.

Constitution of Matter.—Though our studies may not yet have prepared the student for the comprehension of any very elaborate theories, it may nevertheless be of benefit to know something of the opinions which scientists at present entertain concerning the structure of what we call matter.

From a careful study of the phenomena of diffusion, the behavior of matter under the influence of changes in temperature and pressure, and of other observed reactions which need not be mentioned here, physicists have arrived at the following conclusions:

1. That matter is not continuous, or "solid" throughout, but discontinuous, or made up of small particles separated from each other by relatively large spaces. For convenience these particles are called *Molecules*, which means literally, *little masses*.

2. That these particles are not at rest, but are incessantly quivering or vibrating in the free spaces between them.

3. That because of this vibration the particles collide violently and tend to drive each other still further apart.

4. That the rate of vibration, and consequently the range of motion, is determined by the amount of heat present.

5. That the higher the temperature, the more violent the commotion of the molecules, and the harder the blows delivered to one another.

6. That in consequence of the increase in the range of motion, bodies expand with the addition of heat and contract with its withdrawal.

The student who considers this theory of matter for the first time will probably regard it as extravagantly absurd. The object of presenting it here is not that the student may receive it as a finality, but that he may understand the many references which are subsequently made to it in the text.

Number and Size of Molecules.—Some idea of the minuteness of molecules may be formed from the estimation that the smallest cube of dust visible under the most powerful microscope will probably contain from 60 to 100 millions of molecules, or from the often quoted estimation by Professor Crookes that, to count molecules at the rate of ten million per second, it would require 250,000 years to number the molecules in a pin's head!

According to Thompson we may "regard as a very high degree of probability" that in ordinary solids and liquids the "mean distance between the centers of contiguous molecules is less than the hundred millionth and greater than the two thousand millionth of a centimeter."

Professor Tait has estimated that the molecule does not occupy more than five per cent. of the space in which it vibrates. If this be correct, then 95 per cent. of the apparent bulk of a body consists of the spaces between the molecules.

The Three States of Matter.—Commonly matter presents itself in three forms, the Solid, the Liquid and the Gaseous.

A Solid is a body whose form is self-subsistent. If left to itself it will preserve its shape and size indefinitely. In solids we may understand the range of molecular motion to be rather limited and the effect of cohesion great.

A Liquid is a body so mobile as to take the form of any vessel in which it is placed. It always has a definite upper surface which is always parallel to the horizon, except where it comes into contact with the sides of a vessel, at which point it may be either elevated or depressed. In liquids we may conceive the molecular movement to be somewhat freer than in solids, and the cohesion so much lessened that the molecules readily slide over and about each other.

A Gas is a substance which always fills completely every vessel in which it is placed, i. e., when placed in any space it always expands or diffuses into every part of that space so that it is everywhere equally distributed. A gas never has a distinct upper surface, but always conforms its surfaces to the walls of the vessel in which it is confined.

In gases we may imagine the range of molecular motion to be immensely greater than in either liquids or solids, and the influence of cohesion to be almost nil.

Influence of Heat.—The condition which any portion of matter occupies depends *largely* upon the amount of heat present. Sufficient heat applied to a solid may so increase the range of molecular motion as to liquefy it, or may even cause the liquid to assume the state of vapor.

The Radiant State.—When gases are very highly rarefied, as in the so-called Crookes Tubes, they exhibit properties so greatly different from their ordinary properties that Professor Crookes has proposed the term Radiant State to express the nature of matter in this condition.

THE NEWTONIAN LAWS OF MOTION.

More than two centuries ago Sir Isaac Newton enunciated the three laws which bear his name, and which have played an important part in the development of our present knowledge of energy and of the properties of matter. A modified statement of these laws is given below.

First Law of Motion.—A body at rest will remain at rest, and a body in motion will continue in motion, at uniform velocity, and in a straight line, unless acted upon by some external force.

This is frequently known as the Law of Inertia. By inertia is meant the passiveness or inactivity of an inanimate body, or its inability to change its own condition, whether that condition be one of rest or of motion.

That a stone lying upon the earth will remain there until acted upon by some other force is a familiar fact, but that a body set in motion should continue until stopped by some external force seems at first contrary to both reason and experience.

A ball rolled upon the earth soon comes to rest. If rolled upon a pavement it will proceed much farther. If rolled with the same force upon smooth ice, it will continue very much farther. The less the friction, the longer the motion. If all friction could be removed, no reason can be alleged why the motion should not continue forever.

Such conditions cannot be met on the earth, but in space we have the examples of the heavenly bodies which have not within historic times lost a perceptible amount of their motion. That their orbits are curved instead of straight is owing to the attraction of other celestial bodies.

Second Law of Motion.—Change of motion is in the direction in which the external force acts, and is proportional to its intensity and the time of its action.

Two consequences flow from this law. 1. That a body, no matter how great its mass, if free to move, can be set in motion by the slightest unbalanced force. 2. That a given force will always have the same effect in producing motion, whether the body upon which it acts is influenced by other forces at the same time or not. As a consequence of the latter statement, a ball fired from a rifle and one dropped from the muzzle at the same instant should both reach the ground at the same time, otherwise the effect of gravitation must have been arrested by the flight of the projectile.

Third Law of Motion.—Action and Reaction are Equal and in Opposite Directions.

This is equivalent to saying that there is no such a thing as a one-sided force, or a force acting in one direction only. A nail attracts a magnet as much as the magnet attracts the nail. A wagon draws back upon the horses as much as the horses draw upon the wagon. An apple attracts the earth as much as the earth the apple. In the latter case the attraction may seem to be one-sided, but this is only owing to the great disproportion of mass. The earth no doubt moves to meet the apple, but its motion is as much less than that of the apple, as the mass of the latter is less than that of the earth.

SPECIAL NOTICE.

The examination questions on each lecture will be printed on special blanks and mailed direct to each member of the ERA Course. These blanks will be numbered consecutively, and if the student should fail to receive any, notice should be sent of the omission.

(Specially Contributed to the Era for Publication.)

CASCARA.*

By LUTHER F. STEVENS, Brooklyn, N. Y.

I had occasion some two years ago to make a set of trials of the so-called "Aromatic Cascara," and was enabled to furnish a paper to the Kings County Pharmaceutical Society upon the subject, accompanied with samples of the resins, fats, and oils at the time talked about, as obtained in the course of experiments, and an abstract of that report was published in April, 1895.

Certain portions of the matter are used again to-day, while further work since that time, although not entirely complete, and perusal of such literature pertaining to the subject as it has been possible to obtain, enable me to speak now a little more strongly on certain lines.

Cascara Sagrada has of late years drawn much attention because of filling a medicinal loop hole which has remained open since doctoring began. Neither quack nor regular, alchemist nor chemist, Galen, Paracelsus nor Hahneman, were able to show what the Greasers of our far western country did when they brought out the "sacred bark." Other material has approached, but none met the necessity so long felt for a tonic laxative. Upon this fact is based a popularity not soon likely to fail. Yet notwithstanding this acknowledged value, a lasting, disagreeable bitterness has limited its more general adoption, rendering its use in many well indicated cases almost impossible. This very bitterness was for a long time supposed to be a necessary concomitant to the drug, and the supposition was aided and emphasized by the known fact that the component parts were many and complex, hence conservatives, of whom I was originally one, held that the whole was better than any single section.

But careful experiment has shown by indisputable proof that this disturbance can be removed without detriment to any medicinal qualities.

The knowledge gained concerning this representative American drug is a revelation also of painstaking work by many at different times and in various places. Reports come from examiners of note and fame, but equally valuable have been presented by others not so well known.

The greater portion has been accomplished by members of our national association, and the records of the A. Ph. A. are sprinkled with points which betoken progress.

One, however, of the essential principles, was first isolated by a student in the California College of Pharmacy, in 1886. This so startled the faculty that as a consequence one of the professors received credit for the find, when he really only purified what the boy had obtained in a crude state.

Professor A. B. Prescott, of Ann Arbor, in 1879, made a very thorough examination of the bark, determined three resins, giving characteristic tests for each, found tannic, malic and oxalic acids, a heavy oil of yellow color, a volatile oil quite aromatic, wax, starch, and a crystallizable body. This latter, and the yellow resin, he thought deserved much further attention, as it seemed to him quite possible that the crystals were obtained from something else, as a reduction product.

George W. Kennedy, in 1885, determined the total yield of resins to be about 24 per cent.

Limousin, in Paris, in 1885 contended that the resins of Prescott, and for which he gave tests, were all derived from chrysarobin. Since that time, however, all these have been produced by methods in which no reduction was possible, and all respond to Prescott's original tests.

A student in the California College of Pharmacy obtained yellow crystals, and found the substance to be a glucoside, somewhat resembling franguline, but not identical, nor in any way similar to emodine.

Meier and Webber, in 1887, reported a lactic ferment, glucose and traces of ammonia, in new bark, and confirmed the glucoside.

Paul Schwabe, France, finds emodine (frangulic acid) similar to that in rhubarb, and concludes this emodine to be the same as the crystals determined by Wenzell, although that had been abundantly proved to be a glucoside.

Under certain conditions, and in certain stages of analytical work, several have found a white precipitate with Mayer's solution, which seem to indicate an alkaloid.

A. C. Zeig, at Ann Arbor, in 1888, separated the resins of Prescott, and confirmed his tests, also the solubilities in different media, and showed that only one was active. He also demonstrated that a menstruum could be arranged that would leave those that are inert behind, and while the percolation is going on, rather than having a tedious process of purification afterwards. He also obtained the glucoside, and determined it to be such, and also that it was peculiar to this plant.

F. Grazer, of New York, in 1888 reported that the alkali and earth metals, as oxides, remove the bitter taste of cascara, recommending as best for the purpose magnesium oxide.

Leprince, of Paris, in 1892, claims, as have several others, to have found the active principle of Rhamnus Purshiana, to which he has given the name Cascara Leprince. I had a prescription for this a few days ago. It is nicely put up, and patented, and trade marked at every point.

The constituents as ordinarily obtained in pharmaceutical work, so far as known at present, are given in the accompanying table. During the routine of elaborate analysis, when acids and alkalies have been used in excess, there have been found even more.

Traces of an Alkaloid, Chrysarobin and Emodine.—When lime is employed, or strong alcohol alone, to separate resins, either their identity has been lost, or all have not been obtained.

Emodine, it is well known, splits off from the glucoside, along with glucose and a resinous body, when acted upon by acids, or a ferment. It does not appear under ordinary circumstances, nor does any alkaloid.

Our European brethren in their search for the active principle seem to be very sadly mixed up. Several are very sure they have it, but concerning its pharmacognosic position, its chemical and molecular structure, there is still a lively fight.

Schwabe, Leprince, Phipson, Cabannes and others have apparently named the same material as Rhamnoxanthin, Emodine, Frangulic acid and Cascarin, and in 1896 E. Cabannes brings out a new list. He considers the active principles of Cascara Sagrada to be cascarine, rhamnetin, frangulin, rhamnotoxin and chrysophanic acid. He says that these are all concentrated in the bast immediately adjoining the cambian layer, and in the medullary rays traversing these layers.

Now it so happens that in 1879 Prescott examined these same portions of the bark, and determined with the same tests, the same colors, but he went further, and when resins were produced found that these color tests applied to the resins, and these have been accepted by workers as correct since that time.

Schwabe found a glucoside in Frangula, which he named franguline, and gave this chemical formula, $C_{21}H_{20}O_9$; when this is broken up by acids, glucose and emodine split off.

Buchener obtained it in 1853 and called it rhamnoxanthine, and Phipson gives its formula as $C_{12}H_{12}O_5$.

Phipson, in 1892, follows Leprince, saying that the latter's crystalline product is identical with rhamnoxanthine from frangula, having the same general characteristics.

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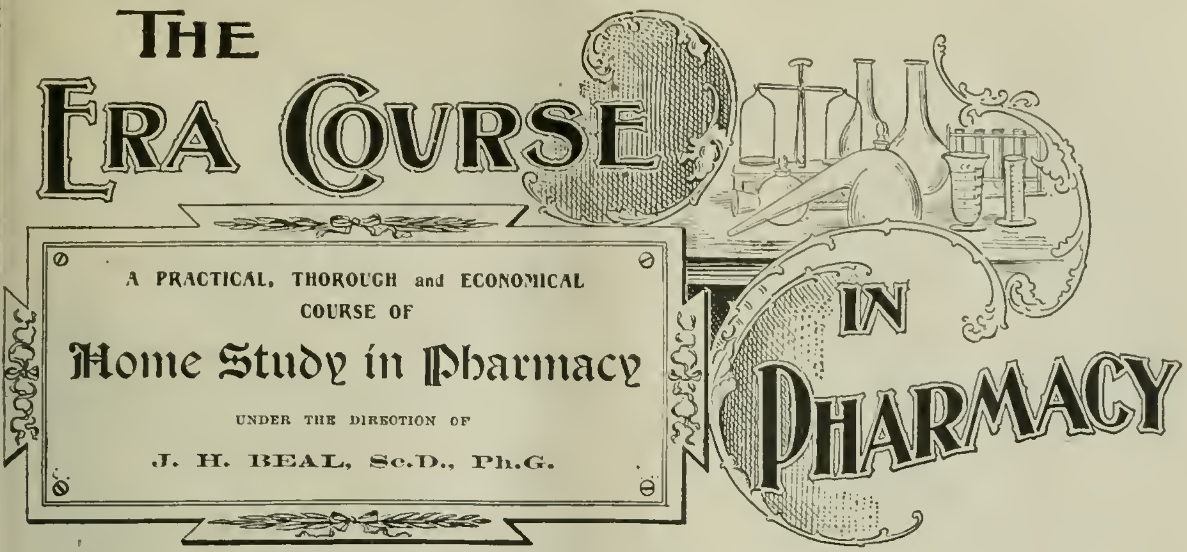
*Presented in abstract at the July meeting of the New York State Pharmaceutical Association at Manhattan Beach.



THE ERA COURSE IN PHARMACY

A PRACTICAL, THOROUGH and ECONOMICAL COURSE OF

Home Study in Pharmacy

UNDER THE DIRECTION OF

J. H. BEAL, Sc.D., Ph.G.

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LECTURE NO. 3.

Chemical Notation and Nomenclature.

INTRODUCTORY.

Chemistry, Chemical and Physical Change.—Chemistry is that branch of physical science which considers the composition of substances and the changes of composition which take place in them. It differs from Physics in that while the latter science deals with the properties and motions of bodies without regard to their composition, chemistry considers the properties and motions of bodies in relation to their composition. The two sciences are, however, closely related to each other, since chemical changes are always accompanied by physical effects, while physical phenomena may in turn give rise to chemical activity.

In general, that may be termed a physical change which causes some alteration in the position, form or condition of a body without affecting its identity, as the heating, bending, or magnetizing of a piece of iron, the melting of ice, or the vaporization of water; and as a chemical change, one which does occasion some alteration in the identity of the substance, as in the rusting of iron, its dissolving in an acid, or the decomposition of water into its constituents, oxygen and hydrogen.

Chemistry concerns itself mainly with the character of the matter before and after an energy change; physics considers chiefly the energy involved in the transformation.

Organic and Inorganic Chemistry.—It is common to divide the science of chemistry into two divisions, Inorganic and Organic. This division of the subject is based upon the view formerly held that the compounds formed within the tissues of organized beings were of a nature essentially different from those which could be artificially produced; hence the name Organic Chemistry for the branch which treated of the former products. The chemistry of artificially formed substances and of those of mineral origin was known as Inorganic Chemistry. The distinction between the two classes of compounds has long since been broken down, and large numbers of the so-called organic compounds are constantly being artificially prepared. Since these are either carbon compounds or derivatives of the latter, the subject is more accurately described as the "Chemistry of the Carbon Compounds." Owing to the great number of these they are better treated separately, so that the division into organic and inorganic chemistry, rightly understood, is still of service.

Elements and Compounds.—Of the substances found in nature the majority may by chemical means be separated into two or more constituents, as Galena, which may be separated into Lead and Sulfur; Salt, which may be separated into the metal Sodium and the gas Chlorin, etc. The substances which are made up of two or more simpler substances chemically united are known as *compounds*. The simplest substances we are able to obtain and which resist all efforts at further division are known as *Elements*. About seventy elementary substances are now enumerated by chemists. All other remaining substances must be viewed as compounds or mixtures of the elements. It is quite possible that many or all of the substances now recognized as elements are themselves composed of one or more still simpler substances.

Physical Mixtures.—A compound in the chemical sense must be carefully distinguished from a mere physical mixture, as a mixture of iron filings and powdered sulfur. From such a combination the iron might be removed by means of a magnet, or the sulfur dissolved out by carbon disulfid. If, however, the mixture of filings and sulfur (in proper proportions) had been subjected to a sufficiently high temperature there would have appeared evidences of chemical action, the sulfur would have disappeared as sulfur and the iron as iron, and in their place would be found an entirely new substance without the properties of either, neither attracted by the magnet nor soluble in carbon disulfid. In the first case there was no true union of the constituents, but a promiscuous mingling without definite order or proportion. In the second case element was united to element, in definite order and in fixed proportions.

Characteristics of Chemical Change.—From the preceding example it will be seen that the chief characteristic of chemical change is the alteration in the properties of substances between which it occurs. Old properties are lost and new ones are gained, while the identity of the constituents is merged into that of the compound which they enter. Other indications of chemical action are temperature changes, as the evolution of light or heat, change of state, as from solid to liquid or the reverse, and especially the fixed numerical proportions of the substances concerned in the action. A common term used to indicate a chemical change is that of *Reaction*.

Kinds of Chemical Change.—Among the numerous varieties of chemical action there are three classes which are of especial importance.

The first kind is where a compound is broken up into its constituents, as mercuric oxid into mercury and oxygen. This kind of reaction is known as *Analysis*, and may include the separation of a complex compound into simpler ones.

The second class is the reverse of the first, as the combination of hydrogen and oxygen to form water. This is known as *Synthesis*, and would include the formation of more complex compounds from simpler ones.

The third class is where both analysis and synthesis occur together, as in the action of sulfuric acid on common salt, when both the old substances disappear, and two new ones, hydrochloric acid and sodium sulfate, are brought into existence. This kind of change is sometimes distinguished by the term *Metathesis*.

QUANTITATIVE CHARACTER OF CHEMICAL ACTION.

There are three important quantitative laws governing chemical action which must be thoroughly understood before the peculiar character of what is implied by a chemical change can be properly comprehended. These are the Laws of Conservation of Mass, and of Definite and Multiple Proportions.

Conservation of Mass.—The sum of the products of a chemical action is always equal to the sum of the factors concerned in the reaction. No matter how the reaction may be brought about, or what may be the magnitude of the bodies involved, there will be neither more nor less matter after the reaction than before. Chemical action changes the association of atoms but not their number.

Law of Definite Proportions.—One of the most striking facts in chemistry is that of constancy of composition. Whatever may be the origin of a compound, whether occurring naturally, or prepared artificially, careful analysis will show that it always contains the same elements in the same proportions by weight and volume. If by any means these proportions are altered, either by adding to or taking away from its constituents, a new compound is formed, possessing new properties. This is expressed in the Law of Definite Proportions, which is "That the same compound always contains the same elements combined in the same proportions by weight."

Law of Multiple Proportions.—Frequently it is found that two elements are capable of combining in more than one proportion. When this occurs, the several weights of the elements whose proportions vary bear a simple ratio to each other, or the higher proportions are simple multiples of the lesser ones. For example, there is known a series of compounds of nitrogen with oxygen in which, conceiving the amount of nitrogen to be 28 parts in each compound, there will be 16 parts of oxygen in the first, 32 parts in the second, 48 parts in the third, 64 parts in the fourth, and 80 parts in the fifth. In each case the increase of oxygen is 16 parts, with no intermediate proportions.

This law may be stated as follows: When two elements, A and B, combine in more than one proportion, then the several proportions of B which combine with a fixed proportion of A bear a simple ratio to each other.

Molecules.—For reasons which are considered elsewhere it is believed that matter is not infinitely divisible, but that if a substance, either elementary or compound, be broken up into smaller and smaller pieces we would at length come to particles of definite size and shape which could not be further divided without destroying the character of the substance, and causing a change of properties. These smallest particles are known as Molecules, and may be defined as the smallest particles of a substance which can exhibit the properties of that substance, or as the smallest particles of a substance that can exist in the free state. Every substance is to be considered as an aggregation of molecules, all of which are alike in structure and properties.

Atoms.—The chemist, however, has reasons for believing that particles exist of still smaller size than molecules. If in the preceding illustration common salt had been considered as the substance taken, when the molecule had been arrived at there would have been reached the smallest particle which could exhibit the properties of common salt. If it were possible by chemical means to divide this molecule, the result would have been, not two pieces of salt, but a metal called sodium and another substance known as chlorin. Since there is no known method whereby these last particles can be still farther broken up, it is assumed that the limit of divisibility has been reached. These smallest particles are known as Atoms. The meaning of the word atom is that which cannot be cut, or that which is indivisible.

The chemist cannot, of course, deal with a single, molecule much less with a single atom, but he can deal with masses of them and by deduction arrive at the properties of single molecules or of single atoms.

Distinctions Between Atoms and Molecules.—Atoms are believed to be generally incapable of existing in the free state. When one combination is broken up they immediately enter another, either with other atoms of their own or of a different kind. When atoms of different kinds are united the result is a compound molecule. When atoms of the same kind are united the result is an elementary molecule.

Elementary molecules usually contain two atoms, but may contain more. In a few instances, it is supposed that elementary molecules consist of single atoms, or that in the case of such elements the atom and molecule are identical. Compound molecules must, of course, always contain at least two atoms, and may consist of many.

Molecules, except when they consist of but a single atom, are divisible; atoms are indivisible.

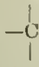
Valence.—As has been seen, compound molecules are formed by the union of two or more atoms. Since by the law of constant proportions, a given compound always contains the same elements in the same proportions, it follows that their molecules must always contain the same number of the same kind of atoms.

Atoms differ greatly in their ability to combine with other atoms. Some atoms can hold only one atom of another kind in combination, while others can hold two, three, four or five. The extent of an atom's combining power for other atoms is known as its *Valence*.

In order to measure the combining power of different atoms it is necessary to have a standard, and for this there is taken the combining power of the Hydrogen atom.

Atoms which can hold one hydrogen atom or its equivalent in combination are *univalent*. If they can combine with two hydrogen atoms they are *bivalent*. If they can combine with three, four, five, six or seven atoms, they are known as *trivalent*, *quadrivalent*, *quinquivalent*, *sexivalent*, or *septivalent*.

The valency of atoms is also distinguished in another way. Univalent atoms are known as *monads*, bivalent atoms as *dyads*, and trivalent as *triads*. In like manner the names *tetrad*, *pentad*, *hexad*, and *heptad* indicate quadrivalent, quinquivalent, sexivalent, and septivalent atoms respectively.

Bonds.—The term Bond is also used to express valence, the atom being considered to have as many bonds as it has units of valence. A dyad has two, a triad three bonds, etc. Bonds are sometimes exhibited graphically by means of dashes attached to the symbol of the atom as  $-\overset{|}{\underset{|}{C}}-$, meaning that the carbon atom has four bonds, or is quadrivalent, etc.

Another method of indicating valence is by attaching indices, or small Roman numerals at the upper right-hand corner of the symbol, as C^{iiii} or C^{iv}.

There are no free bonds in compounds, i. e., one atom will not combine with another unless all of its bonds are neutralized or satisfied by an equal number of bonds of the other element.

Variable Valence.—Atoms always have the same valence in the same compound, but may have different valences in different compounds. The truth of the latter statement is evident from the law of multiple proportions. If two elements can combine in more than one proportion, then their atoms must at different times have different combining powers.

Not only may two elements vary with regard to their valence to each other, but with regard to other elements as well. Many elements differ with regard to their combining powers for hydrogen and oxygen.

When the valence of an atom varies it usually changes from odd to odd or from even to even. For example, the valences of chlorin are 1, 3, 5, and 7, and of sulfur 2, 4, and 6, etc.

Terminations —ous and —c.—To distinguish between compounds in which elements have different valences the terminations—ous and—ic are employed. In mercurous, ferrous, stannous, and other compounds ending in —ous the metal has the lowest valence given in the succeeding table. In mercuric, ferric, stannic, and other —ic compounds the metal has the highest valence given in the table.

Atomic Weights.— Thought it may not be possible to determine the actual weight of the atoms, it is possible to determine their relative weights, or their weights as compared with each other. Thus it is known that the nitrogen atom is fourteen times as heavy as the hydrogen atom, oxygen sixteen times as heavy, and so on. Hydrogen, having the lightest known atom, is taken as the unit and is known as the *microcrith*.

The student must distinguish between atomic weight and valence.

Notation of Atoms. For convenience and brevity, and as an aid to accuracy, atoms are represented by Symbols. A symbol is usually the initial letter of the name of the element, as H for Hydrogen, N for nitrogen, S for Sulfur. When this method would give several elements the same symbol, a second letter is added, as Ni for nickel, Se for selenium, etc. Sometimes the symbol is derived from the Latin name of the element, as Ag for silver, the Latin name for which is *Argentum*, Cu for copper, from the Latin *Cuprum*. It should be noted that the symbol represents one atom only of an element. A symbol is always a capital. If it consists of two letters, the first is a capital and the second a small letter.

Metals and Non-Metals.—An old division of the elements was into two groups known respectively as Metals and Non-Metals. To the former class belonged such elements as gold, lead, iron, and copper. To the second such as sulfur, nitrogen, oxygen, etc. Elements which had a peculiar luster, were good conductors of heat and electricity, and whose oxids and hydroxids combined with acids to form salts were called metals. Elements which did not possess those qualities, or possessed them in less degree, were classed with the non-metals. As the number of known elements became larger and the knowledge of chemistry increased it was discovered that certain elements were capable of exhibiting the characters of both classes, according to circumstances. Consequently the old distinction became of less value as a basis of classification, though still useful where exactness is not required. The metals are also known as the *base-forming* elements, and the non-metals as the *acid-forming* elements.

The "Natural Classification" of the elements, or the Periodic System, as it is generally termed, is an attempt to arrange the elements in such an order as to exhibit all their relationships. This system will receive consideration in subsequent lectures.

LECTURE No. 4.

Pharmaceutical Physics.

The Properties of Matter.

Classification of Properties.—For convenience of study it is useful to divide the common properties of matter into two general classes: Universal or Essential, and Specific or Non-Essential Properties.

Universal or essential properties are such as belong to all matter in common, and from which it could not be dispossessed without destroying matter as we know it, such as Gravitative Attraction, Extension, Indestructibility, Impenetrability, Inertia, and the like.

Specific or non-essential properties are such qualities as any given portion of matter may or may not possess, and which may vary greatly, even in different parts of the same substance. Examples of specific qualities are Malleability, Ductility, Tenacity, Hardness, Brittleness, Density, Divisibility, Color, etc.

Inasmuch as an understanding of many of the preceding qualities is of importance in pharmacy, they will be considered somewhat in detail.

Gravitative Attraction.—By experience it is learned that all bodies upon the earth are attracted toward it with a force varying with the quantity of matter they contain. By comparing the action of this force upon the earth with the motions of the heavenly bodies, Newton discovered that the same law prevails throughout the solar system, and formulated the celebrated Law of Gravitation: that every material particle in the universe is attracted by every other material particle with a force which varies directly as the products of the attracting masses, and inversely as the square of their distance apart.

As the attraction varies directly as the product of the masses, doubling the mass of one of the bodies doubles the attraction, doubling the masses of both bodies, increases the attraction four times.

Since the attraction varies *inversely* as the distance between the bodies, doubling the distance reduces the attraction to one-fourth, trebling the distance would reduce it to one-ninth, etc.

Center of Mass or Centroid.—Every separate particle in a material body is acted upon independently by gravity. The sum of these separate attractions operates like a single force which attachment is located at one particular point variously known as the *center of mass, center of gravity, or centroid.* So far as the action of gravity is concerned, a body behaves as if its entire substance was located at its centroid. (Fig. 1.)

When a body is permitted to fall is passes along a straight line joining its centroid with the centroid of the earth. This is the "line of direction."

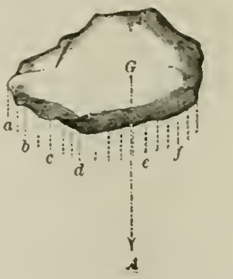
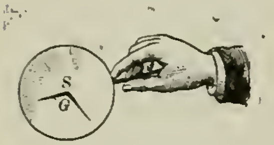


Fig. 1.—Centroid and Line of Direction.

Equilibrium and Stability.—A body left to itself always assumes such a position as will bring its centroid as low as possible, hence to support it is to provide a support for its centroid, or to so place the body that its line of direction will pass through the bases on which it rests.

According to the tendency of a body to stand or fall we distinguish three degrees of stability or equilibrium known respectively as *neutral, unstable*, and *stable*.

Neutral equilibrium is where the body is so supported that its centroid is neither raised nor lowered by a change of position. Such bodies tend to remain wherever placed, as a perfectly balanced wheel on its axle or a perfect sphere of uniform density, resting upon a plane surface. (Fig. 2.)



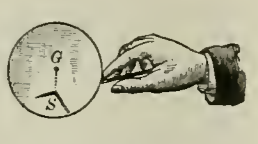


Fig. 2.—Neutral Equilibrium. Fig. 3.—Unstable Equilibrium.

Unstable equilibrium is where a body is in such a position that change of position would lower its centroid, since in that case the body would have no tendency to return to its first position. Such bodies are easily overturned. (Fig. 3.)

Stable equilibrium is where a body is so supported that a change of position would raise its centroid. In this case the body will tend to return to its position after each disturbance. (Fig. 4.)

The higher the centroid of a body must be lifted in order to overturn it, the more stable it is. Consequently the wider the base of a body, the greater the arc through which its centroid must be lifted to overturn it and consequently the greater its stability. (Fig. 5.)

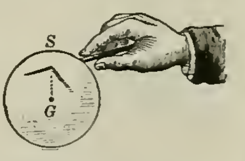


Fig. 4.—Stable Equilibrium.

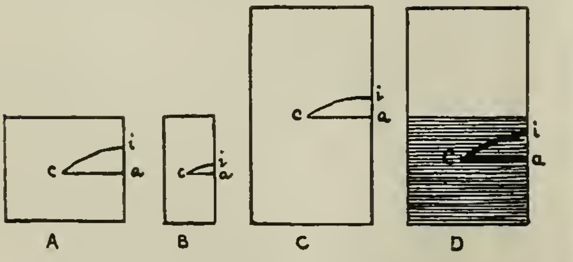


Fig. 5.—Illustrating Relative Stability.

Extension.—By extension is meant the space-occupying qualities of matter.

A mathematical line has extension in one direction only, and a mathematical surface in two directions only, but every particle of matter, even the smallest conceivable, has extension in three directions at right angles to each other, or "length, breadth and thickness."

Relation of Gravitation to Weight.—According to the law of gravity, bodies on the earth's surface are attracted not only by the earth, but also by every other material body in the universe, but on account of its greater mass the earth's attraction overshadows all other attractions, and causes the phenomenon of weight. Thus weight is the measure of the earth's attraction, or rather of the excess of the earth's attraction over the attraction of other celestial bodies.

Weight is not uniform over the earth's surface, but varies with the latitude.

In transporting a body from the pole to the equator it would lose in weight from two causes: 1. The equatorial diameter of the globe is about 43 KM greater than the polar diameter, consequently the distance of the body from the earth's centroid at the equator would be increased and the force of gravity weakened. The amount of this weakening is estimated to be 1-568th of the weight at the pole. 2. In consequence of the greater velocity of the equator (about 1,040 miles per hour), centrifugal force lessens the action of gravity to an amount estimated as 1-289th of the effect at the poles. The conjoined effect of these two causes is to make a total reduction of 1-192d of the polar weight, i. e., a man weighing 192 pounds at the pole would weigh only 191 at the equator.

THE METRIC SYSTEM OF WEIGHTS AND MEASURES.

Among the operations which pharmacists are most frequently called upon to perform are those of weighing and measuring, or the estimation of the masses and dimensions of the substances which they dispense.

The system of weights and measures recognized by the United States Pharmacopœia, and used by nearly all of the civilized nations of the earth, is known as the Metric System. Its advantages over other kinds of weights and measures are so many and so great that it is only a question of time when its use will be universal, and a knowledge of it essential not merely to scientific workers, but to every one who has any relation with trade or commerce.

No one can know the metric system until he has learned to *think* in metric terms. For this reason a brief consideration of the system is presented at this place, and the various illustrations and problems of the subsequent pages will be given in metric units of weight and measure.

A more complete exposition of the subject will be given under Pharmaceutical Processes.

Measurement.—Measurement is comparison, and consists in comparing the thing to be measured with some particular unit selected as a standard. The standard unit must be of the same kind of measure, i. e., linear measurement must be made with standards of length; volume measure, with standards of volume; and weight, with standards of weight.

Measurements may be either of matter, motion, force, or energy. Matter may be the subject of as many kinds of measurement as it has distinguishable properties. For common purposes, however, and especially for the purposes of the pharmacist, the only properties of matter which are made the subject of measurement are those of extension and mass.

Measurement of Extension.—The measurement of extension in one direction is linear or long measure. Measurement in two directions at right angles to each other is surface or square measure. Measurement in three perpendicular directions is volume or cubic measure. The unit of surface is the square of a linear unit, and the unit of volume, the cube of a linear unit.

Measurement of Mass.—The quantity of matter in a body, or its mass, is commonly estimated by weight.

The Era Course in Pharmacy.

JUNIOR YEAR, SECTION A.

In correcting your answers the Quiz Master will use the following symbols:

M means misspelled word.
?—means are you certain?
Rev —means review the lecture.
P. C.—means partly correct.
Ref.—means consult your reference books.
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Make your answers brief and to the point. Use pen and ink. Pay attention to spelling, grammar and penmanship. Answer the questions by number. When one side of the sheet is filled, write on the reverse side.

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Grade on this recitation ______

Questions on Lecture No. 1. ***Subject:*** Relation of Pharmacy to the Medical Sciences, Etc.

1. What is the distinction between a Science and an Art?
2. Define the Principal Subdivisions of Medical Science.
3. What Natural Sciences contribute most to the Science and Art of Pharmacy?
4. Define the principal Subdivisions of Pharmacy.
5. What is a Pharmacopœia? How does the U. S. P. differ from the Pharmacopœias of foreign countries?
6. Name the four Pharmacopœias of greatest importance to the American pharmacist.
7. What is the purpose of a pharmacopœia?
8. Define the terms Official and Unofficial.
9. What are Dispensatories? How do they differ from the Pharmacopœia?
10. Into what three Subdivisions may the subject matter of Pharmacy be divided?

ANSWERS.

This sheet is a **SAMPLE BLANK** of the examination questions which are issued on **EACH LECTURE** and mailed to each member of the Era Course in Pharmacy.

The answers as received are examined by a competent Quiz Master and returned to the student with the master's notes.

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since at the same place on the earth's surface, the masses of bodies are proportional to their weight. The weight of a body, however, is something quite different from its mass, inasmuch as the latter is a permanent quantity, while its weight will vary at different parts of the globe.

Fundamental and Primary Units.—The fundamental unit of a system of weights and measures is the unit upon which the entire system is based, and from which all its other units are derived. The fundamental unit of the metric system is the earth's meridianal circumference, or the length of a great circle passing around the earth from north to south.

The units upon which the measures of length, surface, volume, and weight are severally based are known as the Primary units of their respective kinds of measure.

The four primary units of the metric system are the Meter, Are, Liter and Gram.

Definition of Metric Primary Units.—The theoretical definitions of the metric primary units are as follows:

The Meter (pronounced meeter) is the primary unit of length. It is the forty-millionth part of the earth's meridianal circumference. The Meter is sometimes regarded as the fundamental unit of the system, since all the other units are derived from it. The name of this unit is derived from the Greek *metron*, a measure, and has given its name to the whole system.

The Are (pronounced as the English word are) is the primary unit of surface measure. It is the square of ten meters, or a square ten meters in length on each side.

The are is intended for land measure, or the measure of large surfaces. For small measures the square of the meter or if its subdivisions is employed.

The **Liter** (pronounced leeter) is the primary unit of volume measure. It is the cube of the tenth of a meter, or a cubic decimeter. For the measure of bulky goods the cube of the meter is used, which is known as the Stere (pronounced stair).

The **Gram** (pronounced as spelled) is the primary unit of weight. It is the weight of the quantity of distilled water which, at 4° C., will fill the cube of the one-hundredth of a meter.

Note: The student will learn later in his studies that the actual units differ slightly from the theoretical ones.

Multiple and Sub-Multiples—For some purpose the primary units of the metric system are too large for convenient use, and for other purposes, too small. For this reason they are either subdivided or multiplied so as to give units of convenient size. As the various units increase or decrease by ten, the metric is also known as the Decimal System.

Nomenclature.—In order to use the metric system intelligently it is necessary to understand its nomenclature. To indicate *multiples* of the primary units three Greek numerals are used, as follows: Deka, ten; Hekto, one hundred; Kilo, one thousand. To indicate the *subdivisions* three Latin numerals are employed. These are, Deci, one-tenth; Centi, one-hundredth; Milli, one-thousandth. By combining these numerals with the names of the primary units any metric quantity can be accurately expressed, as kilometer, kiloliter, or kilogram.

The following are samples of the combinations which may be made:

Multiples	Kilo-	meter,	liter or	gram.
	Hekto-	"	"	"
	Deka-	"	"	"
Sub-Multiples	Deci-	"	"	"
	Centi-	"	"	"
	Milli-	"	"	"

Other combinations will suggest themselves.

Relative Importance of the Metric Units.—As in the case of U. S. currency, some of the metric denominations are used more frequently than others. The terms hekto and deka are used infrequently, it being more common to say ten meters, one hundred grams, than to say dekameter or hektogram.

For some of the metric quantities other names are commonly applied. For example, the milliliter is commonly called cubic centimeter. Another term proposed for the same unit is that of *Fluigram*, to express the relation between the milliliter and the gram.

Abbreviations.—There has been a great lack of uniformity in writing abbreviations for metric quantities. Perhaps the most useful are the following:

Meter	= M.	Kilo	= K
Are	= A.	Hecto	= H
Stere	= St.	Deca	= D
Liter	= L.	Deci	= d
Gram	= Gm.	Centi	= c
Cubic Centimeter	= Cc.	Milli	= m

Combining the above we would have:

For Kilometer,	Km.
" Millimeter,	mM.
" Centimeter,	cM.
" Dekaliter,	DL.
" Deciliter,	dL.
" Kilogram,	KGm.
" Milligram,	mGm, etc.

Another method of expressing the units for surface and volume is by attaching the algebraic signs of involution, or "exponents," to the abbreviations for the linear units. Written in this way the symbol for square centimeter would be cM^2, for cubic centimeter cM^3, for cubic decimeter dM^3 for a square meter M^2 for a cubic meter M^3, and so on.

Writing and Reading Metric Quantities—Nearly as much diversity exists in the methods of writing and reading metric quantities as in the abbreviations employed to represent them. The ensuing statements probably represent the better usage.

Fractions of the gram are read as milligrams (not as decigrams or centigrams), or as tenths, hundredths, or thousands of a gram. 1.250 Gm would be read as 1 gram, 250 milligrams.

Fractions of the meter are read as centimeters, instead of tenths or hundredths. Thus 9.075 M would read, nine meters and seventy-five centimeters.

Fractions of the liter are read as cubic centimeters. It is also common to read liters as cubic centimeters where the number of liters is small. Thus 2.500 L would be read as twenty-five hundred cubic centimeters, instead of two liters, five hundred cubic centimeters.

Fractions of the centimeter are read as millimeters. Thus, 0.5 cM would read, five millimeters, instead of five-tenths centimeter.

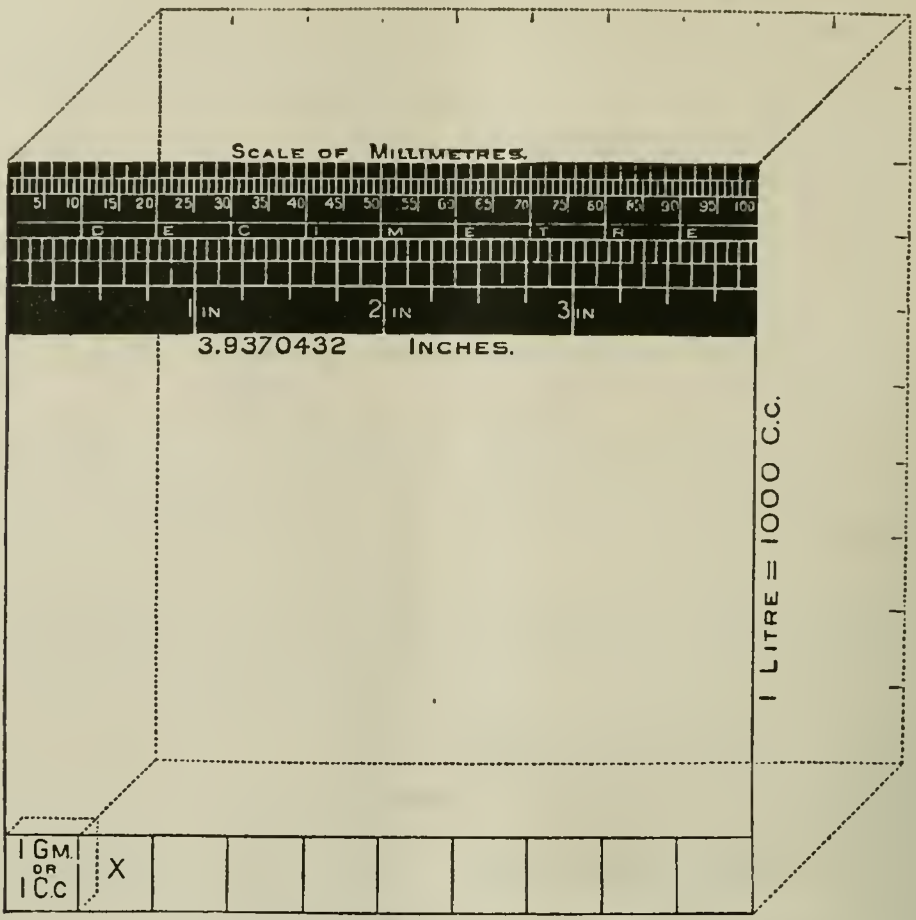
In writing metric quantities probably the best practice is to use the abbreviation representing the denomination which occupies the units place, i. e., the first place to the left of the decimal point. Thus, if the denomination in the unit place represents grams, then use the abbreviation for gram, as 5.275 Gm. If the unit is meter, use the abbreviation M, as 37.215 M. If the unit's place represents milligrams, then use mGm, as 27.5 mGm, meaning twenty-seven and five-tenths milligrams, and so on.

Equivalents of Metric Quantities In the Old Standards.—No one can become an expert in the metric system until he can think in it. The attempt to make use of the new system while employing the old standards will surely create confusion and end in disappointment. Nevertheless, there are a few equivalents which are of use, and which may very profitably be committed to memory:

The Meter	equals	approximately	39.37 inches.
" Liter	"	"	33.81 fluid ozs.
" Kilogram	"	"	32.15 troy ozs.
" Gram	"	"	15.43 troy grs.
" Centimeter	"	"	2/5 inch.
" Cubic Centimeter	"	"	16 minims.
" Milligram	"	"	1/64 troy gr.
" Fluidounce	"	"	29.57 Cc.
" Fluidrachm	"	"	3.69 Cc.
" Troy Ounce	"	"	31.10 Gm.
" Drachm	"	"	3.88 Gm.

The student is advised to thoroughly acquaint himself

Fig. 7.



Metric Diagram—Comparison of Measures of Length, Capacity, Weight.

with the metric units, and their use, before attempting to commit the equivalents given above. The committing of rules for the conversion of one system to another, so frequently given in text books, is a pure waste of time.

PRACTICAL STUDIES.

1. To Find a Centroid of a Body.—Tie a tack to a string, stick the tack into a potato and suspend as in Fig. 6. The line aa prolonged is the "line of direction." Next suspend by inserting the tack at b, the line bc is now the line of direction. Where these two lines cross is the location of the centroid. Repeat the experiment, using a chair, block of wood, box, etc.

2. Practice With Metric Units.—Using Fig. 7 as a pattern, cut a piece of paper the size of the large square. This is 1 dM on each side, or one square dM. Using this paper as a pattern, measure off with it one meter, on a cord or stick, the latter preferred. With the aid of the measured stick or string make the following measurements:

3. Determine your height, waist measure, throat measure, and wrist, in meters and centimeters.

4. Make a diagram of the store room, showing location of counter, shelving, etc. Mark on the diagram the dimensions in metric units, of the room, counters, shelving, doors, windows, etc.

5. Using the square piece of paper again, cut five pieces of cardboard of equal size, and with the aid of paper and mucilage paste them together in the form of a box open at one side. What is the capacity of this box?

6. Fill the box with sand or sawdust, and pour the contents into a graduate or wide-mouthed bottle. Level the surface and mark the level by pasting on a strip of gummed paper. Empty the bottle and fill to the mark with water. If your work has been correct, how many Gm does this quantity of water weigh? How many Cc does it measure?

7. Proceeding according to the methods given, prepare a permanent meter stick, marked in decimeters and centimeters, also a permanent liter measure of glass. A wide mouth bottle will do for the latter.

These measures will, of course, not be exact, but they will help to familiarize the student with the relations of the several units, and to give him an appreciation of their value.

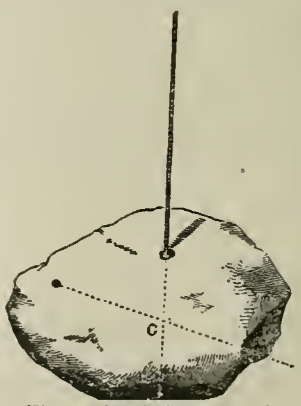
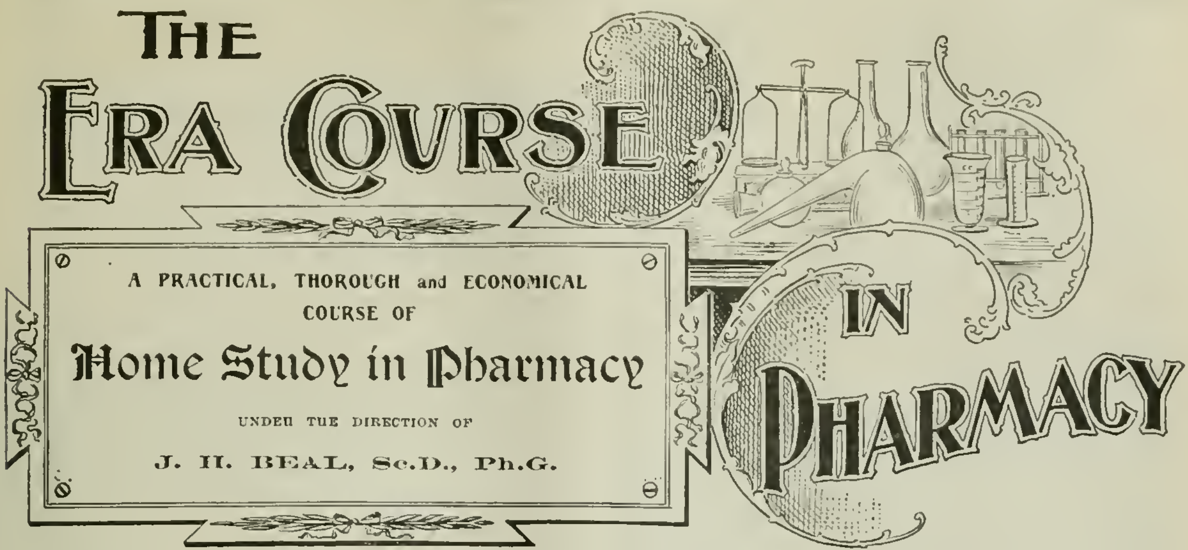


Fig. 6.—To find Centre of Gravity.



THE ERA COURSE IN PHARMACY

A PRACTICAL, THOROUGH and ECONOMICAL COURSE OF

Home Study in Pharmacy

UNDER THE DIRECTION OF

J. H. BEAL, Sc.D., Ph.G.

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LECTURE NO. 5.

Chemical Notation and Nomenclature.

Symbols and Valences of the Principal Elements.

The classification given below is for the purpose of aiding the student in learning the symbols and valences of the principal elements, and should be carefully committed to memory.

NON-METALS.

Valence Monad, Triad, and Pentad.

Fluorin,	F	Monad only.
Chlorin,	Cl	
Bromin,	Br	
Iodin,	I	

The preceding elements are always monads in compounds ending in *—id* (or —ide).

Valence Dyad, Tetrad and Hexad.

Oxygen,	O.	Dyad only.
Sulfur,	S.	
Selenium,	Se.	
Tellurium,	Te.	

These elements are dyads in compounds ending in *—id* (or —ide).

Valence Triad and Pentad.

Nitrogen,	N.	
Phosphorus,	P.	
Arsenic,	As.	
Antimony,	Sb.	
Bismuth,	Bi.	
Boron,	B.	Triad only.

The elements of this family are generally triads in compounds ending in *—ous* and pentads in compounds ending in *—ic*.

Valence Dyad and Tetrad.

Carbon,	C.	
Silicon,	Si.	Tetrad only.

METALS.

Valence Monad.

Hydrogen,	H.
Silver,	Ag.
Lithium,	Li.
Sodium,	Na.
Potassium,	K.

Valence Monad or Dyad.

Copper,	Cu.
Mercury,	Hg.

Monads in *ous* compounds, dyads in *—ic* compounds.

Valence Dyad.

Magnesium,	Mg.
Calcium,	Ca.
Strontium,	Sr.
Barium,	Ba.
Zinc,	Zn.
Lead,	Pb.

Valence Dyad or Triad.

Iron,	Fe.	
Chromium,	Cr.	
Cobalt,	Co.	
Nickel,	Ni.	
Manganese,	Mn.	
Aluminum,	Al.	Triad only.

Dyads in *—ous* compounds, triads in *—ic* compounds.

Valence Dyad or Tetrad.

Tin,	Sn.

Dyad in *—ous* compounds, tetrad in *—ic* compounds.

In explanation of the above table it should be said that antimony and bismuth, though here classed with the non-metals, have very decided metallic properties and might properly have been included in the second table. Hydrogen which is classed as a metal is frequently treated with the non-metals.

The valences given are those which the elements exhibit in their common compounds. They may and frequently do possess valences other than those stated in the table.

Symbols from Latin Names.—The student will have noticed in the table that in some instances the symbol is not derived from the common English name. The following is a list of the names from which such symbols have been taken:

Ag	from	Argentum.
Cu	"	Cuprum.
Fe	"	Ferrum.
Hg	"	Hydrargyrum.
K	"	Kalium.
Na	"	Natrium.
Rb	"	Rubidium.
Sb	"	Stibium.

Formulas. Coefficients and Subscripts.—Compound molecules are represented by writing in a group the symbols of the atoms which they contain, as HCl, KOH, FeS, etc. Such a group of symbols is known as a *Formula*, and represents *one molecule* of the compound.

In the examples just given, each molecule contains only one atom of each element represented, but in perhaps a majority of the substances dealt with by chemists, the molecules contain more than one atom of the same kind. For example, the nitric acid molecule contains one atom each of hydrogen and nitrogen and three of oxygen. How should its formula be written? One way would be to repeat the symbol as many times as the oxygen atom is contained in the molecule, as $HNOOO$, but a better method, and the one adopted by chemists is to make use of a numeral to indicate the number of oxygen atoms and write the formula HNO_3.

A number used in this way is known as a *Subscript*, and applies only to the particular symbol to which it is attached, and to no other.

When it is desired to represent more than one molecule of a compound, the numeral is placed *before* the formula which it multiplies, as $2H_2O$, $4HNO_3$, $3H_2SO_4$. A number used in this way is called a *Coefficient* and multiplies the *entire formula*. $2HNO_3$ means two molecules, each having the composition represented by HNO_3.

Some chemists use coefficients to multiply atoms, as $2Cl$, $2H$, and subscripts to multiply formulas, as $(HNO_3)_4$, but the practice is not to be commended.

Symbols and formulas are not followed by periods, except when a word would be so followed.

Classification of Inorganic Compounds.—The large number of inorganic compounds at present known may be classified either according to the number of the elements in the compound, or according to the properties of the compounds.

Classed according to the first method there are *Binary*, or those composed of two, *Ternary* or those composed of three, *Quaternary*, or those composed of four elements, etc. Classified according to their properties, the three principal groups of inorganic compounds are Acids, Bases, and Salts.

Notation of Binary Compounds.—Since a binary compound is composed of two kinds of atoms, its formula must consist of just two symbols, and since there can be no free or unsatisfied bonds in a molecule, the number of bonds of one element must be exactly equal to the number of bonds of the other.

If both elements have the same valence, the formula will show one atom of each, as $NaCl$, etc., but if they have different valences, the atom having the smaller number of bonds must be taken a sufficient number of times to equal the bonds of the other, as $ZnCl_2$, $FeCl_3$, $BiCl_5$, etc.

In each case the correct number of atoms can be found by taking such a number of each as will give the least common multiple of both valences. Suppose it is required to combine trivalent arsenic with bivalent sulfur. The least common multiple of two and three is six, and to get the least common multiple we take two atoms of arsenic and three of sulfur, or As_2S_3. It is customary to place the symbol of the metal or base first in the formula.

Nomenclature of Binary Compounds.—In the naming of all compounds it is sought to give each compound such a name as will best express its composition.

The names of common inorganic compounds usually consist of two words, the first derived from the metal or base, and the second from the non-metal or acidic element.

The second word of the name of a binary compound consists of the name of the non-metal with its ending changed to —id (or —ide). The same termination, —id (or —ide) is also used in a few compounds which will be given later consideration.

If the metal or base does not commonly form more than one class of compounds its name is used unmodified as the first word of the name of the compound, as *sodium* chlorid, *calcium* oxid, etc. If the metal does commonly form more than one class of compounds, the terminations —ous or —ic are used to indicate which class the compound belongs to, as *mercurous* chlorid, *mercuric* iodid, *ferrous* sulfid, etc.

Some chemists depart from this rule by using the termination —ic in connection with elements which commonly form only one class of salts, as baric chlorid, plumbic chlorid, etc., but the general rule is as given above.

Examples for Practice.

Using the preceding statement as a guide, give the correct chemical names for each of the following compounds:

$LiCl$
$NaCl$
$NaBr$
$CuCl_2$
$CuCl$
FeS
$CaCl_2$
$BaCl_2$
$HgCl$
$HgCl_2$
$FeCl_3$
MnS

How to Determine Valence.—It is evident from the above that in order to write binary formulas correctly one must know the valences which the atoms will have in the compound to be written. This is in most cases indicated by the nomenclature of the compounds. For example, if it is required to write the formula of a mercurous, ferrous, arsenious, or any other —ous compound, it is only necessary to recur to the table of elements in order to learn what valences the elements will have in —ous compounds. The same fact is true for any —ic compound, or for compounds having any other ending.

To Write Binary Formulas.—To write the formula of a binary compound, proceed in the following order:

1. Write the symbols in a group, the metallic element first.
2. Ascertain the valence of each element.
3. As the subscript of the metal, write the figure representing the valence of the non-metal, and as the subscript of the latter, write the figure representing the valence of the metal.
4. Reduce the subscripts to their lowest terms.
5. When a subscript is unity, or when both subscripts are the same, omit them.

Examples.

1. What is the formula for Arsenious sulfid?

The symbols will be As and S. By reference to the table of elements it is learned that the valence of As in —ous compounds is 3, and of S in —id compounds 2. Using the valence of As as the subscript for S, and the valence of the latter as the subscript of the first, gives the formula As_2S_3. Since these subscripts cannot be reduced to lower terms the formula is complete as written.

2. What is the formula for Stannic Oxid?

The symbols are Sn and O. The valence of Sn in —ic compounds is 4, and of O, 2. Using each of these valences as the subscript of the other symbol gives Sn_2O_4. Reducing the subscripts to their lowest terms by dividing by 2, gives SnO_2, the correct formula.

3. Write the formula for Zinc Oxid.

The symbols are Zn and O. The valence of each is 2, which would give Zn_2O_2, but both subscripts being the same, they are omitted, and the formula will be ZnO.

4. Write the formula for Antimonic chlorid.

The symbols are Sb and Cl. The valence of Sb in —ic compounds is 5, and of Cl in —id compounds, 1. Using these as subscripts in the usual manner would give Sb_1Cl_5, but a subscript, when unity is omitted, therefore, the final formula will be $SbCl_5$.

Examples for Practice.

Proceeding according to the method just given, write the correct formulas for the following binary compounds:

Sodium chlorid.
Potassium bromid.
Lithium iodid.
Arsenious sulfid.
Arsenic sulfid.
Stannous chlorid.
Silver oxid.
Mercuric chlorid.
Ferrous sulfid.
Cupric oxid.
Cuprous oxid.
Zinc sulfid.
Chromous chlorid.
Stannous oxid.
Antimonous oxid.
Antimonic oxid.
Bismuthous chlorid.
Bismuthous iodid.
Bismuthic chlorid.
Stannic sulfid.

LECTURE No. 6.

Pharmaceutical Physics.

Properties of Matter.—Continued.

Porosity.—In addition to the visible openings in many substances, there are numerous reasons for believing that even the most solid appearing bodies possess pores or openings between their particles which are invisible, even with the highest power of the microscope. For example, some gases will pass quite readily through thick plates of certain metals, while by sufficient pressure water can be forced through the walls of vessels of iron, gold, silver, copper, etc.

Compressibility and Expansibility.—In consequence of its porosity a piece of metal may be reduced by rolling or hammering, or expanded by heating. It would be difficult to understand how the individual molecules could become larger or smaller, but it is easy to understand that they could be pressed more closely together, or that the openings between them should become larger, and the phenomena of expansion and contraction thus accounted for (Fig. 8).

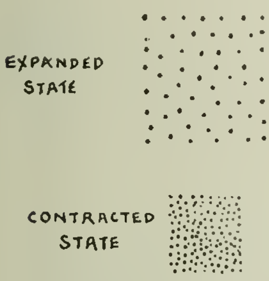


Fig. 8.—Expansion and Contraction of Matter.

Divisibility — Another consequence of the molecular structure of matter is Divisibility. All known portions of matter are divisible into smaller particles. Whether the process of division could be continued indefinitely or whether there are ultimate particles which cannot be farther divided, must be left for later consideration.

Impenetrability.—Matter is impenetrable, that is, it not only occupies space, but excludes other bodies from occupying the same space at the same time. At first sight this may seem incorrect. We move our bodies through the air, drive nails into such substances as lead, project bullets into wood, and cause many other examples of apparent penetration of matter. In all such cases the objects do not actually penetrate the matter, but only shove its particles aside and pass between.

Indestructibility.—Matter is indestructible. Its form may be changed, or it may be broken up and dissipated into space, but by no method known to science can any portion of it be destroyed. Ice can be melted, the resulting water can be vaporized, and the vapor broken up into oxygen and hydrogen, but here our present power ends. Each gas retains its integrity, regardless of the treatment to which it may be subjected. The sum of the products of every transformation, whether chemical or physical, is always equal to the sum of the factors. This statement is known as the Law of Conservation of Mass.

Rigidity, Elasticity and Plasticity.—These are to a certain extent qualities of related natures.

Rigidity is the resistance which a body opposes to a change of form or volume by an external force. Rigidity is slight in fluids and high in solids, but no substance is perfectly rigid.

Elasticity is the property which a body has of recovering its original volume or shape after these have been altered by the action of a force. Fluids are perfectly elastic. No solid is perfectly elastic, though some, as ivory and steel, are approximately so.

Plasticity is the property of yielding to stress, and assuming a new form in consequence. Certain elastic bodies, when subject to stress beyond certain limits become permanently "set" or bent to the new form. The point at which the power of recovery is lost is known as the limit of elasticity, and may be regarded as the beginning of plasticity.

Cohesion and Adhesion.—Cohesion is the form of attraction which holds the constituent particles of a substance together. It is highly developed in solids, slight in liquids and not apparent in gaseous substances. Cohesion is present to some extent in all portions of matter, and has an important effect in limiting such of the properties of matter as depend upon the movements of molecules over one another, as malleability, ductility, viscosity, etc.

Cohesion acts at distances so small as to be insensible. If the molecules are wrenched far enough apart to make the distances between them visible the result is a crack or fracture. The operation of welding or causing the recoalescence of broken matters is simply that of reducing the distance between the severed particles to their original insensible distances so as to permit the restoration of the attraction of cohesion.

Adhesion is the surface attraction between substances of different kinds, as the adhesion of glue to wood, of varnish to furniture, or of water to glass. Like cohesion, this attraction occurs only at very small distance between the surfaces, and is destroyed by increasing the distance to an appreciable amount.

While it is probable that cohesion and adhesion are ultimately due to the same molecular forces, it will be found convenient to speak of them as different properties of matter. Friction is one of the consequences of adhesion.

Influence of Heat.—The general effect of heat is to weaken cohesion and adhesion, and as a consequence to materially affect those particular qualities of matter which are dependent upon them.

Pharmaceutical Applications.

The influence of cohesion and adhesion is of importance in many pharmaceutical operations. For example, in the manufacture of pills, the cohesion of the mass is first developed by the addition of a proper excipient. But after the pills have been formed, they must then be prevented from adhering to each other, or to the box, by the addition of some non-adhesive dusting powder.

In the manufacture of an emulsion, the oil, resin, wax, or other substance is broken up by agitation into numerous minute droplets, which are then kept from coalescing by surrounding each droplet with a mucilaginous coating.

The manufacture of the mass and ointment of mercury are similar examples of the breaking up of cohesion between the parts, and the retention of their separateness by covering them with some adhesive substance.

Principal Phenomena of Cohesion and Adhesion.

On account of the important part which certain phenomena of cohesion and adhesion play in many pharmaceutical processes, and their effect in modifying the properties of numerous pharmaceutical materials, it will be profitable to consider them at some length. Among the more important of the qualities of matter dependent upon cohesion and adhesion are, malleability, ductility, hardness, brittleness, viscosity, diffusion of gases and liquids, solubility, surface tension and capillarity.

Malleability.—Malleability is that property possessed by matter which permits it to be beaten or rolled into thin sheets or leaves. This quality is seen in its highest development in the metals, the most malleable of which is gold, concerning which it is stated that, it may be beaten into sheets so thin that 14,800 are required to make the thickness of one millimeter. In malleation it must be assumed that the quality of cohesion is such that it permits the molecules to slide over each other without severing the bond of attraction.

Ductility.—Ductility is that property which permits certain substances to be drawn into threads or wire, and like malleability has its greatest development in metals. Gold is also the most ductile as well as the most malleable metal.

While nearly related to malleability, this property is not identical with it. For example, copper may be rolled into thinner sheets than platinum, but cannot be drawn into as thin a wire.

Tenacity, Brittleness and Hardness.—Tenacity, nearly synonymous with "toughness" is the resistance which a body offers to being torn apart when subjected to a pull. The most tenacious matter is iron, especially in the form of steel.

Brittleness is a quality which when possessed by a substance enables its particles to be easily broken apart by means of a sharp blow or a crushing pressure. Glass and chalk are examples of brittle substances.

The condition of drugs as to brittleness and toughness is an important factor in their reduction to powder.

Hardness is the degree of resistance which a body opposes to abrasion, or scratching, as the hardness of glass, of highly tempered steel, and the like. The hardest known substance is the diamond.

Hardness must not be confounded with brittleness, though very hard substances are commonly brittle.

Influence of Temperature.—In general the influence of heat is to lessen the qualities of tenacity, brittleness and hardness. To this statement, however, there are some important exceptions, as in the case of zinc, which from 100° C to 150° C. is quite freely malleable, but when heated to 205° C. is easily pulverizable.

Viscosity.—Viscosity is the resistance of liquids to flow, caused by cohesion and internal friction, and is best exhibited in such materials as syrups, oils, tar, etc., which flow stiffly, and are consequently termed viscous or viscid liquids.

Viscosity is a quality opposed to mobility or fluidity, and upon its presence in a greater or less degree depends whether a given substance shall be classed as liquid or solid. No substance possesses perfect fluidity, since even the most mobile liquids, and the most tenuous gases, exhibit a certain amount of internal friction or resistance to flow. On the other hand, many solid bodies either possess a certain amount of fluidity or can be made to develop it through pressure. Under sufficient pressure such substances as gold, silver and copper, can be made to flow into and fill the lines of the cavity in which they are placed. It is this quality which renders them available for purposes of coinage. Such substances also as asphaltum, shoemaker's wax, burgundy pitch, etc., will slowly flatten out and take the shape of the vessel in which they are kept. In short, they might be regarded as liquids of relatively high viscosity.

Surface Tension of Liquids.—Another important phenomenon is Surface Tension, which is the term used to indicate the fact that the surface of a liquid behaves as if it were a thin skin or membrane tightly stretched over the liquid beneath.

This phenomenon is due to unbalanced cohesion. Beneath the surface every molecule is subject to equal cohesion on all sides from the surrounding molecules. The molecules of the surface layer, however, are subject to cohesion only on their sides, and underneath. This attraction being unbalanced by any attraction above the result is that the surface layer of molecules behaves like a very thin elastic membrane.

It is owing to surface tension that a drop of liquid always assumes a round surface, and that droplets suspended in other liquids, as in emulsions, are always spherical.

ADHESION PHENOMENA.

Although cohesion and adhesion are closely related properties, there are certain classes of physical reactions in which the adhesion side of the phenomenon or the attraction between different substances is especially prominent.

There are perhaps no varieties of matter between which some adhesion does not exist, if brought into contact, though in many cases other circumstances may operate to conceal its action. Solids may adhere to solids, liquids to liquids, gases to gases, or any one of these to either of the others.

Many of the phenomena of adhesion are of great importance to pharmacy.

In several varieties of diffusion the peculiar character of the action is perhaps due more to molecular motion than to adhesion, yet the latter effect is of sufficient importance to justify their consideration at this place.

Capillarity.—When a solid, as a pane of glass, is dipped into a liquid, the latter is either raised or depressed along the line where the two surfaces meet. If the liquid wets the solid, the line of junction is elevated, if it does not wet the solid, the line is depressed.

If a clean glass tube of very narrow bore be used, the elevation or depression is still more marked. When the liquid rises in the tube its upper surface forms a "meniscus," i. e., concave or hollowed out: if the liquid is depressed the meniscus will be inverted, or the surface will be convex or cone-shaped. The name capillarity for this effect is derived from the circumstance that it is most marked in tubes of capillary bore. (Figs. 9, 10.)

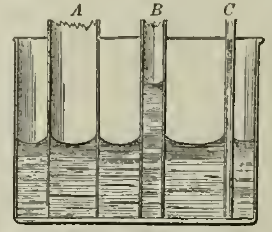


Fig. 9.—Water in Capillary Tube.

The principal facts of capillarity are expressed in the following statements:

1. Liquids rise in capillary tubes when they wet them and are depressed when they do not.

2. The elevation or depression varies inversely as the diameter of the bore. The narrower the tube the greater the elevation or depression.

3. The elevation or depression varies inversely with the temperature, the higher the temperature the less will be the rise or fall.

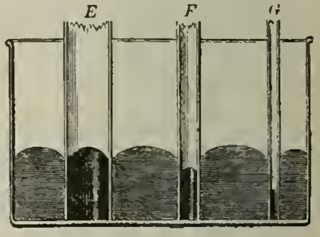


Fig. 10.—Mercury in Capillary Tube.

4. The phenomenon varies with different liquids and solids.

Capillarity is a mixed phenomenon of adhesion and cohesion. Where adhesion between the liquid and solid is greater than cohesion in the liquid, the solid will be wet by the liquid. When the cohesion of the liquid is stronger, the solid will not be wetted.

The elevation and depression, and the curved surface are due to surface tension; in the one case tending to draw the liquid upwards, and in the second case downwards.

Pharmaceutical Applications.

Many pharmaceutical processes involve capillary action. It is capillarity which causes a liquid in a strainer or filter to crawl up the sides, and sometimes over the top.

If the lower surface of a porous substance, like sugar, be dipped in a liquid, the latter will gradually rise throughout the entire mass.

In open vessels of salt solutions surface tension will carry the liquid up the side, where by evaporation of the solvent the salt is left behind as a porous mass with strong capillary powers. This porous mass then acts as a wick to conduct the liquid to still greater heights, until it may pass over the edge of the jar on to the shelf on which it stands.

Whatever will destroy the adhesion between the liquid and the vessel, as rubbing the sides with oil or petrolatum, will prevent the creeping.

The rise of oil in a wick, or the saturation of a sponge are analogous actions.

Adhesion and capillarity play an important part in drug extraction, in affecting the solution of the soluble constituents and the rate of flow of the menstruum.

Diffusion of Gases—If two vessels containing gases of different densities are connected by a narrow passage, there will be a movement of molecules from each vessel to the other until eventually the two gases are evenly mixed throughout. This mixing occurs even if the vessel containing the lighter gas be placed above the vessel containing the heavier one.

Gaseous diffusion is due mainly to molecular motion, since adhesion between the molecules of gases must be regarded as very slight.

Diffusion of Gases Into Liquids.—When a gas is confined in contact with a liquid, diffusion into the latter occurs, the extent of the diffusion depending upon pressure, adhesion and temperature.

In general the amount of gas diffused, or dissolved, in the liquid is proportional to the pressure. Doubling the pressure, doubles the amount of gas dissolved, and so on.

Adhesion is also an important factor, independent of the pressure applied, and the amount of gas dissolved will vary greatly in consequence. Where the adhesion is great, as between water and ammonia, the liquid may absorb hundreds of times its own volume of the gas. Where the adhesion is slight, as between water and nitrogen, the amount dissolved may be very small.

Diffusion of Gases Into Solids.—Nearly all solids possess the property of absorbing, or "occluding" gases, the latter being apparently condensed upon the surface of the solid. A platinum vessel allowed to stand a few minutes will gain perceptibly in weight from the air condensed on its surface. In the form of fine powder platinum is said to be able to occlude 250 times its own volume of oxygen.

Porous substances, as charcoal, have remarkable powers of gaseous absorption, and hence are valuable as a means of atmospheric purification. Carbon monoxid diffuses readily through red-hot iron. The most remarkable example of the diffusion of gas into a solid is seen in the reaction between palladium and hydrogen in which the metal may absorb 980 times its volume of the gas.

Diffusion of Liquids.—Adhesion plays a most important part in the mixing of liquids. Where two liquids, as water and alcohol, are brought into the same vessel, if the adhesion between the two kinds of molecules is greater than the cohesion between each kind, the two liquids will diffuse into each other and form a homogeneous mixture. Such diffusion will take place slowly, or immediately with agitation. Mutually diffusible liquids are termed "miscible."

If the cohesion between each kind of molecules is greater than adhesion between the two, the liquids will remain separate, the heavier at the bottom, or if shaken forcibly together, will separate on standing. Such liquids are termed "immiscible," as glycerin with ether, water with oil, etc.

Diffusion of Solids Into Liquids.—The solution of a solid in a liquid is, in general, a phenomenon of diffusion, depending upon the relative forces of cohesion and adhesion. When cohesion in the solid is stronger than its adhesion for the liquid, diffusion, or "solution," does not take place and the substance is said to be insoluble. If adhesion is the stronger, diffusion occurs, and the solid is said to dissolve.

If the occurrence of solution was independent of adhesion, it is difficult to understand why a solid should not be equally soluble in all liquids, since all gases are equally diffusible into each other.

The effect of adhesion also explains why a powdered solid should dissolve more rapidly than one in lumps. Adhesion is due to surface action, and the surface of a solid is greatly extended by reducing it to fine particles

Practical Studies.

1. Place together two clean glass plates in the position shown in Fig. 11, with their lower edges resting in water. Vary the distance apart of the plates and note the different heights to which the liquid rises. Explain why it does not rise to an equal height at all points?

2. Wipe the glass plates perfectly dry and repeat the experiment, using petroleum or some other liquid instead of water. What different results are obtained? Explain.

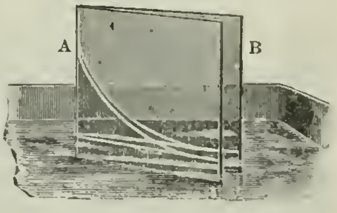


Fig. 11.—Rise of Liquid on Glass Plates.

3. Provide several glass tubes of narrow bore and different diameters. Dip them first into mercury. Is the mercury raised or depressed? In which tube is the phenomenon most marked?

4. Repeat the last experiment, using water instead of mercury. How does the result differ?

THE QUIZZES.

The questions on Lecture No. 1 were mailed September 9, one week after the publication of the first lecture. It is desirable that a few days should intervene between receipt of lecture and questions in order that the student may fully master the former before attempting answers to the latter. The questions will be mailed regularly and promptly after each lecture. They are printed on special blanks and mailed direct to each member of the ERA Course. These blanks will be numbered consecutively, and if the student should fail to receive any, notice should be sent of the omission.

SECRET REMEDIES.—Dr. H. Weller (says Br. & Col. Dr., quoting from Ap. Ztg.) has analyzed several secret remedies, chiefly American, and gives the following details of some of them: Albert's remedy (A. E. Hughes, New York) is stated to contain 29.5 per cent. of extractive in which opium alkaloids and colchicine could be detected, 7.9 per cent. potassium iodide, 14.6 per cent. potassium acetate and 10.3 per cent. of alcohol. Dr. White's eye water is given as 1.73 per cent. zinc sulphate, 2 per cent. honey, 2.56 per cent. alcohol and 0.2 per cent. free acetic acid.

(Special Report to the Era.)

THE INTERNATIONAL CONGRESS OF PHARMACISTS AT BRUSSELS.

Brussels, August 20, 1897.

At the close of the Seventh International Congress of Pharmacy, held at Chicago in 1883, it was decided that the time and place of the next gathering should be fixed by a committee which was appointed for the purpose. Seeing no action taken in the matter

The Belgian Pharmacists Took the Initiative,

and as the fiftieth anniversary of their General Association fell in 1897, concurrently with the Brussels Exhibition, they addressed a letter to "Prof. Remington, of Chicago," proposing King Leopold's capital as a suitable site. "I have been trying to make them understand how many hundred miles there are between Chicago and Philadelphia," remarked the Professor. "Anyway, the letter reached me rather late, and before I had consulted all my colleagues, the Belgian Association had arranged everything."

These facts, together with the coincidence of a Medical Congress at Moscow and the Glasgow meeting of British Pharmacists, account for the abstention of Germany, and the inadequate representation of many other European States.

The Brussels University Building,

where the Congress was held, nevertheless, contained a goodly show of foreign delegates at the opening meeting on Aug. 14. Seven European countries were officially represented—Austria by Dr. Augustus E. Vogl, professor of materia medica at the Vienna University; France by Prof. Prunier, Paris School of Pharmacy; Holland by Dr. H. Wefers-Bettink, professor at Utrecht University; Mexico by Señor Altamirano and Professor José D. Moralès; Norway by Mr. Strömer; Roumania by Mr. Anton Altan, of Bucharest, and Sweden by Mr. Sebardt.

The United States

had delegated Prof. Joseph P. Remington, of Philadelphia; Dr. Power, who is, I believe, attached to the Wellcome Research Laboratory at London, England, and Mr. Alfred Meyer, of New Orleans. MM. Adrian, Crinon, Petit, and Viron had come from Paris; M. Collard and half a dozen others from the larger French towns, while the numerous Dutch contingent included Messrs. Hoffmann, Schoep (Maestrecht), Van Italie (Rotterdam), and Wynne (Middlebury). Drs. Tichborne and McWalter represented Ireland; from England came Mr. W. A. Wrenn, Mr. A. C. Wootton ("Chemist and Druggist"), and Dr. Paul (Pharmaceutical Journal). I understood that Italy, Switzerland, and Germany each had one representative present.

Dr. Fernand Ranwez,

President of the Belgian General Association, and professor at Louvain University, took the chair, supported by Mr. Duyk, the indefatigable secretary; Mr. Van Bastalaer, who presided over the 1885 International Congress, etc., etc. Mr. De Bruyn, Minister of Hygiene, represented the Belgian Government.

The platform was nicely decorated with plants and flags, the King's bust and the arms of Brussels, and a brass band in the gallery played various national anthems between the speeches.

M. Ranwez greeted the foreigners, and sketched the history of his association. Founded by Puypers, of Antwerp, in 1847, it had dwindled twenty years later to 67 members; when in 1873, under M. Gille's able chairmanship, it increased to 400. The Education Act of 1876 lowered the examination standard, the number of pharmacists doubled in ten years, and tripled in fifteen. Then came the Committee of Defence and the struggle for a higher standard—won in 1890. Pharmacy inspectors were appointed, pharmacists were admitted to the local Health Councils, and other improvements made in their status. Much remained to be done; a separation of the professions of Doctor and Pharmacist was especially needed; he asked Mr. De Bruyn's aid in this matter.

M. De Bruyn, Minister of Agriculture, Public Works and Hygiene, said "all came to him who knew how to wait"—the pharmacists included. He spoke in high terms of the profession in general, and in particular of the ex-Presidents of the Association, Messrs. Gille, Van Bastalaer and Depaire. He suggested they should amicably arrange with the Doctors to draw up a law, just and satisfactory to all; and he hoped to have the pleasure of signing such an act.

M. Duyk, a Brussels pharmacist, alluded to the Chicago Congress, and the $1,000 voted by the A. Ph. A. toward the cost of an International Formulary, and other interesting details; and then rose Mr. Alfred Meyer, of New Orleans. In the most fluent French ("We all speak like that in Louisiana," he modestly told me afterward) he expressed the foreign delegates' gratitude at the kind reception given them by the Minister and the Congress in "this country, so small in territory, but so great in activity, industry and intelligence." His short speech won him the heartiest applause of the morning, and then the band struck up, and the meeting dispersed.

The Various Sections

held their first meeting at 2 p. m. the same day. It would be hopeless, in a short resumé like the present, even to give the titles of all the subjects discussed. The burning "patent medicine" question gave rise to the liveliest discussion. It was voted that every patent medicine should bear on the label the dose and the names of its ingredients. Nor can I, I am sorry to say, reproduce in extenso

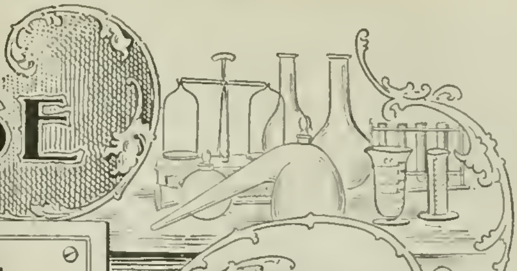
Prof. Remington's Paper on Doctors and Pharmacists,

with special reference to the compilation and revision of Pharmacopeias. He pointed out the right and the necessity of the presence of pharmacists on such committees, and denounced the "class legislation" that put the doctor on a higher footing than the pharmacist. He asked if a medico-pharmaceutical union could not be formed to arrange that secret remedies should be no longer prescribed by doctors or sold by pharmacists.

Prof. Tichborne, of Dublin, thought that in England and Ireland this interprofessional jealousy was dying out, but that the doctor must always rank first. He referred to the new British Pharmacopeia and mentioned that special supplements were to be added for the Colonies and India—the use and action of drugs varied so much in different countries.

Dr. McWalter, of the same city, did not share the opinion of the last speaker as to the amicable relations of the two professions in the United Kingdom. He paid

THE ERA COURSE IN PHARMACY



A PRACTICAL, THOROUGH and ECONOMICAL COURSE OF

Home Study in Pharmacy

UNDER THE DIRECTION OF

J. H. BEAL, Sc.D., Ph.G.

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LECTURE NO. 7.

Chemical Notation and Nomenclature.

Classification and Notation of the Acids and their Salts.

Acids, Bases, and Salts.—Classified according to their properties the three chief divisions of inorganic compounds are Acids, Bases and Salts. Any of these may be either binary, ternary or quaternary.

Acids are compounds containing hydrogen which can be replaced by a metal, have, when soluble, a sharp, sour taste, and the property of changing the color of the blue dye Litmus to red. Such a change of color is known as an "acid reaction." Acids are mainly compounds of the non-metals.

Bases are compounds which can neutralize acids by replacement of their hydrogen, have, when soluble, a caustic, disagreeable taste, and possess the property of restoring the blue color to Litmus which has been reddened by acids. This color change is known as an "alkaline reaction." Bases are chiefly compounds of the metals.

Salts are the compounds which are formed when bases and acids neutralize each other. They consist, usually, of the metal of a base combined with what remains of an acid after the removal of all or part of its hydrogen.

All acids contain hydrogen, while nearly all bases contain a metal. Though hydrogen is present in all acids, it is itself basic in character. The acid qualities are due to the non-metal with which it is combined. The terms acid and base are relative. A given compound may act as a base toward some substances, and as an acid toward others.

Nomenclature of Acids.—Acids which do not contain oxygen are known as Hydrogen acids, or simply as Hydracids. All others are known as Oxygen acids, or oxacids.

The hydrogen of an acid which can be replaced by a metal is known as *basic hydrogen*. Acids with one atom of basic hydrogen are called *mono-basic*, with two atoms, *di-basic*, with three, *tri-basic*, with four, *tetra-basic*.

It is customary to write the basic hydrogen of an acid at the beginning of the formula, as HCl, H_2S, HNO_3, though this is not essential.

Two methods of naming acids are in common use. According to one method they are regarded as salts of hydrogen and named like other salts, as Hydrogen chlorid, and Hydrogen sulfate. The other method calls especial attention to their acid character by including the word acid in the name. Named in this way the two preceding compounds would be called Hydrochloric acid, and Sulfuric acid respectively.

Binary Compounds of Hydrogen.—Hydrogen combines directly with very few metallic substances. Its binary compounds with non-metals are generally acids. Exceptions are seen in Ammonia, NH_3, and Phosphine, PH_3, where the three atoms of hydrogen are sufficient to overcome the acid qualities of the non-metal and to confer upon the compounds basic characters. Its binary compounds with oxygen or carbon are generally neutral substances.

The remaining hydrogen compounds with non-metals are mostly typical acid substances, and have a wide application in the arts, in chemical operations, and in medicine and pharmacy.

Table of Binary Hydrogen Acids.—The student should commit to memory the names and formulas of all the acids given in this and the two following tables:

HF,	Hydrofluoric	Acid,	or	Hydrogen	Fluorid.
HCl,	Hydrochloric	"	"	"	Chlorid.
HBr,	Hydrobromic	"	"	"	Bromid.
HI,	Hydriodic	"	"	"	Iodid.
H_2S,	Hydrosulfuric	"	"	"	Sulfid.

Binary Compounds of Oxygen.—Oxygen has a very wide range of combining power, uniting either directly or indirectly with almost every known element. Its binary compounds with the other elements are known by the general name of oxids, and like the corresponding compounds of hydrogen, their properties vary with those of the elements which they contain. As a rule, the oxids of the metals are basic in character, and those of the non-metals acidic.

Many of the oxids have the property of dissolving in or combining with water to form compounds known as *Hydroxids* or *Hydrates*. The compounds thus formed manifest the properties of the oxids from which they are derived; those from basic oxids are basic, and those from acidic oxids, acidic.

Basic oxids and hydroxids are both known by the general term of Bases. The hydroxids of the non-metals constitute the class of compounds known as the Inorganic Oxygen acids.

The student should here recall the statement previously made, that a compound may act as a base toward some substances and as an acid toward others.

Nomenclature of Oxygen Acids.—The oxygen acids have the terminations —ous or —ic, corresponding to the oxids from which they are actually or theoretically derived, as sulfurous acid from sulfurous oxid, sulfuric acid from sulfuric oxid, arsenious acid from arsenious oxid, arsenic acid from arsenic oxid, etc.

Some elements are capable of forming more than two oxygen acids, when it is necessary to adopt some additional means of distinction. If the third acid have more oxygen than either of the other two it retains the termination —ic, but takes in addition the prefix Per, as *perchloric* acid. Should there be a fourth acid with less oxygen than either of the first two, it retains the termination —ous, and takes the prefix Hypo, as *hypochlorous* acid. The following examples illustrate the rule:

$HClO$,	Hypochlorous Acid.	$HClO_3$,	Chloric Acid.
$HClO_2$,	Chlorous "	$HClO_4$,	Perchloric "

Table of Common Oxygen Acids:—

HNO_2,	Nitrous	Acid,	or	Hydrogen	Nitrite.
HNO_3,	Nitric	"	"	"	Nitrate.
$HClO_3$,	Chloric	"	"	"	Chlorate.
$HBrO_3$,	Bromic	"	"	"	Bromate.
HIO_3,	Iodic	"	"	"	Iodate.
H_2CO_3,	Carbonic	"	"	"	Carbonate.
H_2SO_3,	Sulfurous	"	"	"	Sulfite.
H_2SO_4,	Sulfuric	"	"	"	Sulfate.
$H_2S_2O_3$,	Thiosulfuric	"	"	"	Thiosulfate.
H_2CrO_4,	Chromic	"	"	"	Chromate.
H_3AsO_3,	Arsenious	"	"	"	Arsenite.
H_3AsO_4,	Arsenic	"	"	"	Arsenate.
H_3PO_4,	Phosphoric	"	"	"	Phosphate.

The Cyanogen Acids.—This class of acids differs from the preceding classes by being neither binary hydrogen compounds nor the hydroxids of non-metals. Since they contain hydrogen, but, with one exception, are without oxygen they are usually considered in connection with the hydracids.

The cyanogen acids are distinguished by their containing the radical Cyanogen, CN, which in this case behaves like a single univalent atom of a non-metal.

The usage as to the naming of these acids and their salts has not been uniform. The termination of the acid is in each case —ic, but the prefix hydr— is sometimes added, and sometimes omitted. The salt of the first acid in the table always ends in —ate, and that of the second in —id (or —ide). The salts of the remaining ones are sometimes given the termination —id and sometimes —ate.

In writing the formulas for these acids and their salts CN is frequently contracted to Cy.

Table of Cyanogen Acids:—

$HCNO$,	or $HCyO$,	Cyanic	Acid, or	Hydrogen	Cyanate.
HCN,	or HCy,	Hydrocyanic	" or	"	Cyanid.
$HCNS$,	or $HCyS$,	Sulfocyanic	" or	"	Sulfocyanate, or Sulfocyanid.

$H_3Fe(CN)_6$, or H_3FeCy_6, Ferricyanic Acid or Hydrogen Ferricyanid.

$H_4Fe(CN)_6$, or H_4FeCy_6, Ferrocyanic Acid or Hydrogen Ferrocyanid.

Sulfocyanic acid is sometimes known as Thiocyanic. Ferro— and Ferricyanic acids are frequently given the prefix Hydr—.

Some Organic Acids.—It would be impossible here to enter upon a discussion of the constitution and character of the numerous known organic acids. It will be sufficient for our present purpose to state that their properties are, in general, like those of the inorganic acids, and to give the names and formulas of several of the more common ones:

$HCHO_2$,	Formic	Acid,	or	Hydrogen	Formate.
$HC_2H_3O_2$,	Acetic	"	"	"	Acetate.
$H_2C_2O_4$,	Oxalic	"	"	"	Oxalate.
$H_2C_4H_4O_6$,	Tartaric	"	"	"	Tartrate.

The radicals of the organic acids, frequently contain hydrogen which cannot be replaced by metals. The hydrogen written first in the preceding formulas is basic hydrogen, and can be substituted by other basic substances.

Theory of Salts.—Many of the compounds known as salts may be formed by direct combination of their elementa, but theoretically they may all be regarded as resulting from the reaction of a base with an acid.

In most cases when an acid and a base act upon each other the basic hydrogen of the acid is driven out, and its place taken by an equivalent of the metal of the base, the oxygen and hydrogen of the base being likewise eliminated. Thus the reaction of sodium hydroxid, $NaOH$, with hydrochloric acid, HCl, would form the salt $NaCl$, and not $NaOHHCl$.

In a few cases, however, a base and an acid may unite directly without the elimination of any of their atoms. An example of this kind is seen in the combination of ammonia, NH_3, and hydrochloric acid, HCl, to form ammonium chlorid, NH_4Cl. This also represents the general method of formation of the salts of the alkaloids in organic chemistry. An acid oxid may also unite directly with a basic oxid to form a salt, as BaO with SO_3 to form $BaSO_4$.

Nomenclature of Salts.—Salts are commonly divided into Normal, Acid, Double and Basic.

A Normal salt is one in which all of the basic hydrogen of the acid has been replaced by a metal, as $NaCl$, $CaSO_4$, Li_3PO_4, K_4FeCy_6, etc.

An Acid salt is one in which only a portion of the basic hydrogen has been replaced, as $NaHSO_4$, Na_2HPO_4, etc. A mono-basic acid cannot, of course, form an acid salt.

A Double salt is one in which either two bases are united to one acid radical or two acid radicals to one base. An example of the first kind is seen in Rochelle salt, which is $NaKC_4H_4O_6$, one atom of hydrogen being replaced by sodium and one by potassium. An example of the second kind is $PbCl_2,PbCO_3$.

Basic salts are frequently very complex. Probably the best view the beginner can take of them is that they are combinations of a normal salt with an oxid or hydroxid, as Basic Zinc Carbonate, $3Zn(OH)_2,ZnCO_3$, the two compounds being separated by commas.

The correct name of a normal salt can in every case be formed by substituting the name of the metal or base for the word hydrogen in the list of alternative titles given for the different acids in the preceding tables.

By bearing this statement in mind and recurring to the several lists of acids, the following facts will be noticed:

That salts of the binary acids all have the termination *—id* (or *—ide*).

That salts of the cyanogen acids sometimes have the termination *—id* (or *—ide*) and sometimes *—ate*.

That salts of acids ending in *—ous* always have the termination *—ite*.

That salts of acids ending in *—ic* always have the termination *—ate*.

That when an acid has a prefix, as hypo—, thio—, per—, etc., its salts have the same prefix. The hydracids are an exception, the prefix *hydr—* being usually omitted from the salts, except in the case of their compounds with the alkaloids.

Radicals.—A Radical is any combination of two or more atoms, of different kinds which may pass from one compound to another without breaking up. The compounds CN, and NH_3, already cited, are examples of radicals. Another very common radical is *hydroxyl*, OH, found in the hydroxids, it has one bond, or acts like a univalent atom.

In acids, all that part of the molecule except the basic hydrogen is known as the "acid radical." Since this is the portion which unites with a metal to form a salt, the latter is sometimes defined as a compound of a metal and an acid radical.

In general, radicals are incapable of existing in a free state, and when released from one combination immediately form another, either with a radical of their own or of a different sort. When two CNs are forced from their combination they unite to form the compound C_2N_2, or cyanogen proper. When two hydroxyls are set free with nothing else to unite with they will unite with each other and form hydrogen dioxid, H_2O_2.

Anhydrids.—It has been previously seen that the oxygen acids may be regarded as formed from the oxids of nonmetals by their union with water. Such acid forming oxids are known as the *anhydrids* of their respective acids, as SO_2, the anhydrid of sulfurous acid, SO_3, of sulfuric acid, and CO_2, of carbonic acid. Oxids of the metals are sometimes called

Basic anhydrids.—By a reversal of the process, or the withdrawing of water from an oxygen acid leaves the anhydrid.

Some acids cannot be made from their anhydrids, and some anhydrids cannot be obtained from their corresponding acids, but the term *anhydrid* is nevertheless a convenient one and much used.

LECTURE No. 8.

Pharmaceutical Physics.

Diffusion Continued, Properties of Fluids.

Diffusion Through Membranes.—An important kind of diffusion is that which takes place in solutions separated from each other by parchmentized paper or animal membranes.

If a bladder, showing no sensible pores under the microscope, be filled with strong salt solution, a narrow tube inserted in its mouth and tied fast, and the arrangement suspended with the bladder under water, there will in course of time be a rise of liquid in the tube, showing the entrance of water from the outside. (Fig. 12.) If the water in the outer vessel be tested it will show the presence of salt.

This passage of liquids and salts through apparently impervious membranes is termed *Osmose*. Since we cannot look upon matter as penetrable, we must regard the passage of the salt and liquid in osmose as taking place through the insensible pores or intermolecular spaces in the membrane. Such substances as crystallize easily, as the various chemical salts, and chemically related substances, diffuse through membranes readily. Uncrystallizable, glue-like, or amorphous substances do not diffuse or only with great slowness. For the first class Professor Graham has proposed the term Crystalloid and for the second Colloid. It is evident therefore that osmose offers a method of separating crystalloids and colloids from each other.

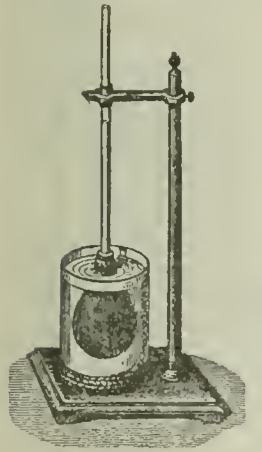
Fig. 12.—Diffusion Through Animal Membrane.

Pharmaceutical Applications. The Dialyzer.—For the practical application of the principle of osmose to the separation of crystalloids and colloids, an apparatus termed a dialyzer is employed. This may be of various forms, but a common one is in the shape of a deep hoop, as the rim of a sieve, across one side of which a piece of parchment paper is tightly drawn. The material to be separated is placed in the dialyzer and the latter floated on or suspended in water contained in a larger outer vessel. (Fig. 13.)

If, for example, the dialyzer contained an acidified infusion of an alkaloidal drug, the salts of the alkaloid would pass outward through the membrane, and could thus be obtained by evaporation of the water in the outer vessel, while the colloidal matter of the infusion would remain in the dialyzer.

The process may be made use of by toxicologists to separate crystalloidal poisonous substances from mixtures of organic matter which would interfere with their identification by chemical tests.

The form of the dialyzer is of minor importance. All that is necessary is the means of dividing the liquids to be subject to osmose by means of an appropriate membrane. A very efficient dialyzer is the inverted funnel shown in the figure. (Fig. 14.)

Osmose plays an important part in the animal economy. It is by this process that the nutrient portions of the food pass from the intestinal cavity into the blood vessels, and from the latter to the tissues. In like manner, it is by osmose that the tissues discharge their waste products back into the blood. Osmose is also the method by which the roots of plants absorb materials from the soil, and one of the forces by means of which the ascent of sap from the roots to the highest part of the tree is accomplished.

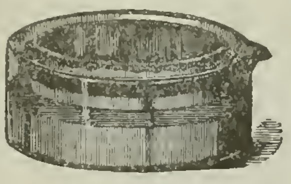
Fig. 13.—Dialyzer.

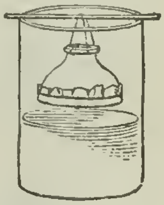
Fig. 14.—Inverted Funnel Dialyzer.

Osmotic Pressure.—Generally but not invariably, the greater amount of osmose will be from the less dense liquid to the denser one. A dense liquid in the dialyzer, as syrup, will gradually increase in volume, while decreasing in density. By appropriate means it can be shown that this increase in volume, if restrained by pressure, may exert a force equal to three or four atmospheres. This exhibition of force is known as *osmotic pressure*.

From the circumstance of osmotic pressure, and allied phenomena, it has been thought that substances in solution are in a state of partial dissociation whereby their molecules are able to act as if they were in the gaseous state.

Influence of Temperature.—Heat has, in general, an important effect upon diffusion phenomena. In the case of the diffusion of gases into gases, and liquids into liquids, raising the temperature accelerates the action by increasing the rate and range of the molecular motions. The same effect is usually observed in the diffusion of solids into liquids, or solution, but this is not invariably so, a few substances being less soluble in hot than in cold liquids. The diffusion of gases into liquids is usually interfered with by raising the temperature, most gases being less soluble in hot than in cold liquids. If the gas is already in solution, raising the temperature will cause its expulsion, unless this be restrained by pressure.

Certain melted metals, however, as silver and copper, have the property of absorbing large quantities of oxygen while in the molten state, which they give off, almost explosively, when cooling.

PROPERTIES AND LAWS OF FLUIDS.

Because of the mobility of their particles and their possession of many physical properties in common, liquids and gases are classed together under the general name of *Fluids*.

It is usual to consider the mechanical properties of fluids under three heads or titles, Hydrostatics, Hydrodynamics and Pneumatics.

Hydrostatics treats of the properties of liquids at rest, or in a state of equilibrium. Hydrodynamics, or Hydrokinetics, treats of liquids in motion.

Pneumatics treats of the mechanical properties of *Gases*. In the study of liquids, water is adopted as the type, and is always understood unless some other liquid is mentioned. Air is, in the same way, adopted as the type of gaseous fluids.

Surface of a Liquid at Rest.—The surface of a liquid at rest conforms to the curvature of the earth. For surfaces of small area this may be regarded as practically a plane, except where the liquid touches the walls of the vessel. For large areas, as the ocean, the curvature amounts to eight inches for the first mile from any stated point and thereafter increases as the square of the distance.

Increase of Pressure With Depth.—In an incompressible fluid, pressure is proportional to the depth. Taking the pressure at any given depth, at twice that depth the pressure will be twice as great, at three times the depth, three times as great, and so on. This is the rule for liquids, since these are practically incompressible.

With gaseous fluids, as the atmosphere, the pressure will increase more rapidly than the depth, since, owing to their compressibility, the lower layers are much denser than those above them, and are consequently much heavier for equal thicknesses.

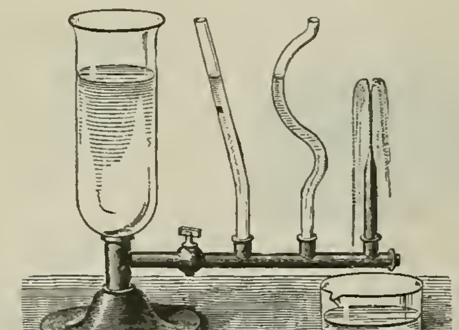

Fig. 15.—Balanced Columns of Liquids.

Pressure Equal in All Directions.—At any given point in a fluid the pressure is equal in every direction. If the downward pressure is equal to a certain number of grams or kilograms, then the upward pressure and the pressure in every other direction at that point will be the same number of grams or kilograms. That this must be true is evident from a consideration of the fact that if the pressure should be greater in one direction than another, then the fluid would necessarily flow away from that point and in the direction of the least pressure. The result would be a current which would continue until the pressure became equalized.

Balanced Columns of Liquid.—If several columns of a liquid are connected at their bottoms, the liquid will stand at the same level in each, no matter what their respective diameters or forms may be. (Fig. 15.) Since pressure is proportional to depth, if the liquid in one column stood higher than in another, its greater downward pressure would be unbalanced, and a current would be set up to the other columns until the pressure at the bottom of each should be equal, which would be when their surfaces were at the same altitude.

It is owing to this principle that the water in the water gauge of a steam boiler does not rise above the water level in the boiler, or that the water in the spout of a teakettle does not rise above that in the kettle.

Transmission of Pressure in Fluids.—When pressure is applied to a solid, as a block of wood, the whole body tends to move in the direction of the force. There is no lateral pressure or spreading out, unless a crushing force be applied. But pressure applied at any point of a fluid confined in a vessel is *transmitted instantly and without diminution to every other point*. If the area pressed upon is 1 cM and the pressure applied is 1 Gm, then every other centimeter of the inner surface of the vessel will receive a pressure of one Gm. The total pressure on the inside of the vessel will be as many grams as its walls measure centimeters in area. (Fig. 16.)

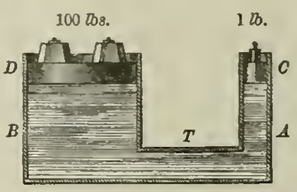

Fig. 16.—Transmission of Pressure in Liquids.

Pressure Due to Weight.—As a further consequence of the law that pressure is proportional to weight and is transmitted equally in all directions, the pressure upon the bottom or side of a vessel is dependent upon the *area pressed upon, and the height of the liquid in the vessel, and is independent of the diameter of the column of liquid*. In every case the pressure will be equal to the weight of a column of liquid whose cross section is equal to the area pressed upon, and whose length is the greatest height of liquid in the vessel. If the area pressed upon is 10 cM^2 and the height of liquid in the vessel 100 cM, then the pressure will be equal to the weight of a column of liquid of the same dimensions. The actual cross section of the column may be very much less.

Bursting of a Bottle Filled With Liquid.—This fact explains why it is so easy to burst a bottle by attempting to insert a cork when it is filled to the brim with a liquid. Presuming the lower surface of the cork to have the area of 1 cM, and the inner surface of the bottle an area of 200 cM, then according to the above principle, a pressure of 1 KGm on the cork would produce a total outward pressure of 200 KGm on the bottle. (Fig. 17.)

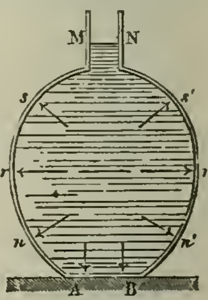

Fig. 17.—Pressure on Vessel Filled with Liquid.

An old and well worn illustration of this principle is the bursting of a cask by inserting into its head a pipe of small diameter and filling to the top with water. The pressure on the bottom and sides of the cask being the same as if the pipe had as large a diameter as the keg, is too great for the strength of the latter and causes its rupture. (Fig. 18.)

Pharmaceutical Applications.—Advantage is taken of this principle in the manufacture of a particular style of pressure percolator for pharmaceutical use. After the perco-

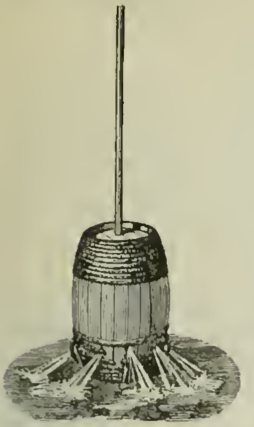

Fig. 18.—Bursting Cask by Pressure of Liquid.

lator has been packed, the top is tightly closed, and connected by a flexible tube to a reservoir of menstruum which by means of a pulley can be raised to the ceiling. When the apparatus is in operation, the pressure upon the upper surface of the drug will be the same as if it were pressed upon by a column of liquid of the same diameter as the percolator, and as high as the reservoir.

The Hydraulic Press.—A practical application of the power of fluids to transmit pressure equally in all directions is shown in the construction of the Hydraulic Press, an apparatus used to some extent in manufacturing pharmacy, with which it is possible to exert great pressure through a short distance. In its simplest form it consists of two connected cylinders differing greatly in diameter, each containing a movable piston. The smaller of the cylinders and pistons constitute a pump whereby a liquid, generally water, can be forced into the other cylinder, thereby forcing the larger piston upwards. The latter is made to carry a platform upon which is placed the article to be submitted to pressure. (Fig. 19.)

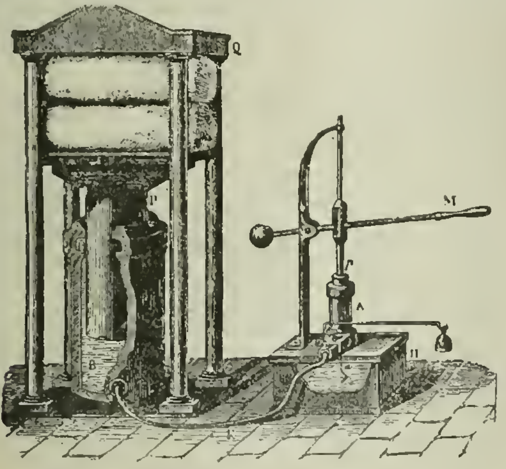

Fig. 19.—Hydraulic Press.

Ignoring friction and other losses, any pressure applied to the pump will exert as much greater pressure upon the larger piston as the area of the latter is greater than the area of the pump piston. If the ratio is as 1 to 100, then a force of 100 KGm applied to the smaller would cause a pressure of 100 × 100 = 10,000 KGm at the other.

The operation of this machine does not conflict with the law of conservation, since, although the force is multiplied 100 times, the energy is not increased. In fact, there is always a considerable loss of energy, due to friction and imperfections in the apparatus, so that the amount of work done by the machine is invariably less that the work done upon it.

To Calculate the Pressure of a Liquid on Its Container.

To calculate the pressure on the *bottom* of a vessel, multiply *the area pressed upon by the greatest depth of liquid in the vessel.*

To calculate the pressure on the side of a vessel, *multiply the area of the side by the distance from its middle point to the surface of the liquid.*

In the latter case the *average* depth is taken, because the pressure at the top of the side will necessarily be less than at the bottom.

Buoyancy.—The subject of buoyancy, or the loss in weight of bodies immersed in liquids, will be considered in connection with the subject of Specific Gravity.

Hydrodynamics.—Though of great importance to the science of engineering, hydrodynamics is scarcely of sufficient applicability to pharmacy to justify its consideration.

PNEUMATICS.

Compressibility of Gases.—While liquids are practically incompressible, gases are the most compressible bodies known.

The relation of their volume to the pressure they are subjected to is expressed in what is known as Boyle's, and also as Mariotte's Law, which may be stated in general terms as follows: Temperature remaining the same, the volume of a gas varies inversely as the pressure to which it is subjected. If the pressure be doubled, the volume will be reduced one-half, or if the volume be doubled, the pressure will be reduced one-half, etc. Since one of the factors increases to the same extent that the other decreases, it follows that for any given amount of gas the product of its volume by its pressure will be a constant quantity, under any variation of pressure. If the volume of a gas be 100 Cc and its pressure 1,000 Gm, the product of these two quantities, 10 × 1,000, will equal 10,000. If now the pressure be doubled, the volume will be halved, but the product (5 × 2,000) will remain the same quantity. Boyle's Law is not constant for extreme limits of pressure.

Pharmaceutical Applications.—Boyle's Law affords a convenient method of correcting the volume of gases found in analytical operations, so as to conform to standard pressure. For example, the gas in a nitrometer measures 42 Cc, when the barometer stands at 740 mM. What would be its volume at the standard pressure of 760mM? The product of the observed volume by the observed pressure, 42 × 740 = 31,080. Since the product is a constant quantity for any pressure, the volume at 760 mM would be $\frac{31,080}{760} = 40.89$ Cc.

Influence of Temperature on Volume.—The volume of a gas is greatly influenced by the temperature, increasing with the addition of heat and decreasing with its withdrawal. If we consider the volume of a gas at 0° C. and under constant pressure, then its expansion will be 0.00367 of that volume for each additional degree of temperature. The fraction 0.00367 is known as the Coefficient of Gaseous Expansion, and enables us to calculate changes in the volumes of gases due to changes in temperature. (For a fuller consideration of the variations in the volumes of gases from variations in temperature and pressure, the student is referred to Notes on Equation Writing and Chemical Arithmetic, by J. H. Beal.)

Pressure of the Atmosphere.—In general the same laws apply to gases as to liquids, including the equal transmission of pressure in all directions, but on account of their great compressibility the law of regular increase of pressure with increase of depth does not apply.

That air at the surface of the earth is under great compression can be shown by placing a partially inflated rubber balloon or bladder under the receiver of an air pump, and then exhausting the air, when the residual air in the balloon will expand the latter until it may nearly fill the receiver.

Commonly we are aware of the presence of the atmosphere only by the act of respiration, by its temperature, and by the friction of the winds. If it possesses weight, we are not sensible of it. Really, however, it does possess weight and our bodies are subject to enormous pressure in consequence, but the tissues being everywhere supported by corresponding pressure from within, we pass through the air, like fishes in the sea, unaware of the tremendous burden on our shoulders.

PRACTICAL STUDIES.

Arrange a dialyzer as shown in Fig. 14. For the membrane use parchment paper. Hold the paper to the light, and if any holes appear stop them with collodion. Fill the dialyzer with a strong solution of common salt, well up into the neck of the funnel, and suspend in a vessel of clear water. Examine every hour or so for 24 hours. Does salt pass through into the outer vessel? Has there been any passage of water from the outer vessel into the dialyzer?

BOOKS FOR STUDY.

A number of students have asked our special advice regarding the choice of books for the study of the Era Course in Pharmacy. We have several times published a list of standard works from which the student can make his own selection of books on the various subjects. We would say to all inquirers that there are a few books which every student should have; these are the United States Pharmacopœia, a Dispensatory (either the United States or National), a good work on general pharmacy (Remington, Coblentz, or Caspari.) Beyond this the student can exercise very largely his own preference in the selection of books, but he should have a good one upon each subject treated by the lecturers. For instance, lectures on chemistry are now being given. Let him purchase a general chemistry, either Attfield, Fownes, Simon, etc., etc. We advise students not to purchase too many books in advance, but rather wait until each subject is taken up in its turn, and then act upon the advice and suggestion of the lecturer. We expect that throughout the course each lecturer will state his preferences as to text books, but the student cannot go astray if he gets the three or four standard works above mentioned, and then as each subject comes to notice get a reliable reference work upon that subject. This answer may be taken in reply to a large number of inquiries constantly received from readers.

THE QUESTION BLANKS.

Some students have expressed anxiety because they have not received the question blanks very soon after the publication of the lectures. The class is very large now, and the clerical work necessary in getting out the blanks and keeping full records is great. Students whose names are at the beginning of the list will receive their questions a little earlier than those at its end, and those who have enrolled but recently must not expect to be served quite as promptly as those first on the list. Two or three days is necessary for sending any set of questions to the entire class, and the time of their receipt will depend upon the distance the student is from the mailing place; it may take four or five days to reach him. Farther than this, we would state that it is not intended to mail questions upon every lecture separately; this will be left largely to the judgment of the quiz instructor. Sometimes the student may receive the questions for three or four lectures at one time, while at another time he will get but one set. This depends very largely upon the nature of the subject, so we ask the students not to feel perturbed if they do not receive all questions just when they expect them. Arrangements are complete for keeping the work up in satisfactory manner. Every student duly matriculated will get his questions, and his replies will be returned to him in regular, systematic order.

Approved by Boards of Pharmacy.

H. G. Webster, Secretary Minnesota Board of Pharmacy, Minneapolis, Minn.—I have examined your Course in Pharmacy as outlined in the Era, and think it admirably well fitted for students who are unable to take a full course at a college of pharmacy, and there are many such. Your list of contributors should insure the success of your plan. Any plan which stimulates study and a desire to excel on the part of those who wish to enter upon the practice of pharmacy will meet with my approval and encouragement.

W. H. T. Barnes, Secretary Washington State Board of Pharmacy, Seattle, Wash.—I have carefully read the prospectus of the Era Course in Pharmacy, and assure you I am in hearty sympathy with this method of pharmaceutical education. There is no excuse for ignorance when one can get a college education for the price of so excellent a journal as the Pharmaceutical Era. I will take great pleasure in recommending this Course in Pharmacy to the applicants for our next examination.

PEANUT OIL AND ITS USES IN PHARMACY AND THE ARTS.*

BY S. P. SADTLER.

The ordinary peanut, or earthnut, is the seed vessel and seed of arachis hypogæa (leguminosæ) a plant largely cultivated on the West coast of Africa, in India and in the Southern Atlantic States. The nuts vary quite appreciably in the quality and yield of oil obtainable from them. Thus Consul Mason, in the U. S. Consular Reports for April, 1894, gives the following statement of their relative value as sources of oil.

The principal varieties are graded in the market according to richness in oil and general merit as follows (the percentage being based upon equal weights of shelled kernels in condition for grinding):

Senegal peanuts	51 per cent
Congo peanuts	49 per cent
East African peanuts	49 per cent
Bombay peanuts	44 per cent
Madras peanuts	43 per cent
American peanuts	42 per cent

As to quality of oil this report ranks the African first (at a price from 56 cents to $1 per gallon); the American next (at 59 cents per gallon), and the East Indian last (ranging from 40 to 50 cents per gallon).

Spanish nuts are not mentioned in this report of Consul Mason. A report of Consul Thomas (U. S. Consular Reports, July, 1894), mentions them as furnishing a small part of the imports at Marseilles, but gives no statement of their relative rank or price. The quality of oil undoubtedly differs somewhat according to the locality where the nuts are obtained, but these differences are not so great as those dependent on the condition of expression and care in the choice of sound nuts.

The "cold drawn" oil of the first expression is a very pale yellow and has a pleasant taste resembling the flavor of kidney beans. It is used in both France and Germany as salad oil and no doubt comes to us from Marseilles in considerable amounts under the label of "virgin olive oil." The oil obtained by second expression also serves as table oil, as well as for burning. The third quality expressed at higher temperature is chiefly used for soap making, for which it is a very satisfactory raw material. In fact, much of the finest soap made at Marseilles, is now made from the peanut oil which is expressed there on an immense scale from African or East Indian nuts.

From a chemical point of view peanut oil is distinguished from the other oils of the olive oil group in containing the glycerides of two of the higher fatty acids of the saturated series, viz., arachidic acid $C_{20}H_{40}O_2$, and lignoceric acid $C_{24}H_{48}O_2$, along with the oleic acid of the unsaturated series.

The percentage of free fatty acids in the cold pressed oil is very slight, usually less than 1 per cent., and if the oil is freed from this by treatment with a little aqueous alkali, it will preserve its sweetness of taste and freedom from rancidity much longer than most of the fatty oils.

As regards its physical properties, its specific gravity ranges from 0.911 for the best African cold pressed oil to 0.9209 for dark colored hot pressed oil.

The cold test, or beginning of turbidity from the separation of solid particles, also varies according to the quality of the oil. The best African oil is given a cold test of +2°C. (35.6°F.), the best Indian oil +5°C. (41°F.), while a dark colored hot pressed oil showed +10°C. (50°F.)

I have recently had occasion to examine some samples of American peanut oil, expressed at Norfolk, Va., from Virginia peanuts wholly or in part. I will state the results of their analysis in tabular form, placing alongside for comparison some partial analyses of peanut oil from foreign sources and then speak of some of its practical

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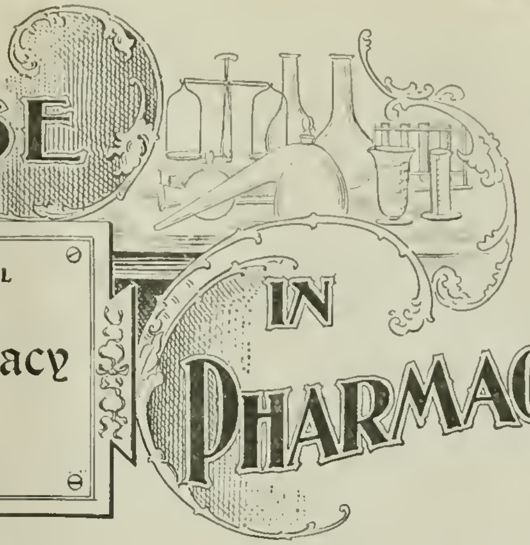
*Read at the meeting of the American Pharmaceutical Association, Lake Minnetonka, 1897.

THE ERA COURSE IN PHARMACY



A PRACTICAL, THOROUGH and ECONOMICAL
COURSE OF
Home Study in Pharmacy
UNDER THE DIRECTION OF
J. H. BEAL, Sc.D., Ph.G.

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LECTURE NO. 9.

Chemical Notation and Nomenclature.

Practice in Writing and Naming Salts.

Writing Salts.—The method of writing formulas of binary compounds already given, applies as well to all binary compounds which may be regarded as salts of the binary hydrogen acids. With slight modification the rule will serve also for writing the formulas of salts of the cyanogen and oxygen acids, all of which have radicals consisting of more than one atom.

1. Treat the radical as if it consisted of a single atom with as many bonds as there are atoms of basic hydrogen in the acid to which it belongs. Thus the radicals of HCy, HBr, HNO_3, $HClO_3$, have each one bond, the radicals of H_2SO_4, $H_2C_2O_4$, each two bonds, and the radicals of H_3PO_4, H_3AsO_3 H_3FeCy_6, each three bonds.

2. Write the symbols of the metal and the acid radical in a group, as in writing the formula for a binary compound, thus $NaSO_4$, $NaFeCy_6$, $BaNO_3$, etc.

3. As the subscript of the metal write the number of bonds of the acid radical, and as the subscript of the radical the number of bonds of the metal, as Na_2SO_4, Na_3FeCy_6.

4. If the acid radical is taken more than once, draw marks of parenthesis about it, and write the subscript outside of the parenthesis, thus $Ba(NO_3)_2$.

5. If the radical is used only once, the parenthesis is omitted. Subscripts are also omitted in the same cases as for binary compounds.

Examples.

1. Write the formula for Sodium sulfate.

The symbol group will be $NaSO_4$. The radical SO_4 comes from H_2SO_4 and has two bonds, while Na has one bond. Therefore, the subscript of Na will be 2, and the subscript of SO_4 will be 1, or since the latter is unity it will be omitted and the completed formula will therefore be Na_2SO_4.

2. Write the formula for Silver cyanid.

The symbol group will be AgCy, (or CN). Ag and Cy each have one bond and both subscripts will be unity; they are therefore omitted. The correct formula is AgCy.

3. Write the formula for Barium nitrate.

The symbol group will be $BaNO_3$. The bonds of Ba are 2, and of NO_3 1. Transposing and using as subscripts the formula becomes $Ba(NO_3)_2$.

4. Write the formula for Bismuthous sulfate.

The symbol group is $BiSO_4$. The Bi has 3 bonds and the SO_4 2 bonds. Transposing and using these as subscripts gives the formula $Bi_2(SO_4)_3$.

5. Write the formula of Ferric ferrocyanid.

The symbol group is $FeFeCy_6$. The bonds of the Fe of the base are 3, of the $FeCy_6$ of the radical the bonds are 4. Transposing these figures and using them as subscripts gives the formula $Fe_4(FeCy_6)_3$.

Examples for Practice.

Proceeding according to the method given, write the correct formulas for the following compounds:

Sodium cyanid.
Sodium sulfocyanate.
Potassium ferrocyanid.
Sodium ferricyanid.
Ammonium sulfate.
Ammonium nitrate.
Ferrous oxalate.
Ferric tartrate.
Ferric acetate.
Ferrous sulfate.
Bismuthous nitrate.
Cupric ferrocyanid.
Calcium phosphate.
Stannic nitrate.
Antimonous sulfate.
Zinc acetate.
Cupric hydrate.
Bismuthous arsenate.
Nickelous ferricyanid.
Manganous nitrate.

Doubled Formulas.—Mercurous and cuprous salts, ferric and chromic salts, the salts of aluminum and some others, are written by most chemists as if they always had an even number of atoms in the molecule, and never an odd number. Thus, instead of writing mercurous chlorid $HgCl$, it is written Hg_2Cl_2; instead of $FeCl_3$, Fe_2Cl_6; instead of $Al(OH)_3$, $Al_2(OH)_6$, etc.

The explanation of this is that there are some reasons for believing that the real valence of the metals in these compounds is greater than their apparent valences. For example, it is assumed that the atom of iron in ferric compounds has four bonds, but that by the union of two atoms, one bond of each is neutralized, leaving only a total of six free bonds for the two, or three bonds for each atom, as represented by the diagram $-\overset{|}{\underset{|}{Fe}}-\overset{|}{\underset{|}{Fe}}-$.

Though the theory of an even number of metallic atoms in the molecules of the compounds spoken of is held by many chemists, and is recognized by the formulas adopted in the U. S. Pharmacopœia, the subject may still be considered as open to discussion. There is excellent authority for writing them as the compounds of the other elements are ordinarily written.

To construct double formulas, first write them according to the methods already given for writing salts. In many cases the formula thus written will show an even number of atoms of the metal, as Hg_2SO_4, mercurous sulfate. If it does not, then multiply the subscripts of both the metal and the radical by the smallest number which will make the *subscript of the metal an even number*. It does not matter whether the subscript of the radical is an even number or not, though, of course, the total bonds of the radical must equal the total bonds of the metal.

Examples for Practice.

Write the formulas for the following compounds, making each formula show an even number of atoms of the metal:

Cuprous iodid.
Cuprous chlorid.
Cuprous oxid.
Cuprous cyanid.
Mercurous chlorid.
Mercurous bromid.
Mercurous sulfate.
Ferric chlorid.
Ferric hydroxid.
Ferric arsenate.
Ferric ferrocyanid.
Ferric ferricyanid.
Aluminum hydroxid.
Aluminum chlorid.
Chromic nitrate.
Chromic phosphate.
Mercurous chromate.
Mercurous iodid.
Cuprous arsenite.
Ferric sulfate.

Water of Crystallization.—The molecular formulas thus far considered are intended to represent the chemical constitution which the various compounds have independent of their physical condition. Very many salts, however, are incapable of assuming the form of crystals without the presence of a certain number of molecules of water. For example, the official sodium carbonate and sodium sulfate are crystalline only when for each molecule of the salt there are present ten molecules of water. If the salts are heated until the water is all driven off a dry powdery mass is left weighing less than one-half as much as the original salt. Water combined in this manner is known as "Water of Crystallization." It is to be regarded not as a part of the compound proper, but as an essential to the building of the crystal.

In writing chemical formulas it is not common to take the water of crystallization into consideration, but in Stoichiometry, or the arithmetic of chemistry, and in quantitative analyses, the amount of water present must be known and allowed for.

When water of crystallization is represented in the formula, it is separated from the remainder of the formula either by the plus sign, a comma, or by a period, thus, $Na_2CO_3+10H_2O$, or $Na_2CO_3.10H_2O$, or Na_2CO_3, $10H_2O$.

Practice in Nomenclature.

As the means of practice in the principles of chemical nomenclature the student will write out in full the correct chemical names of the compounds represented by the following formulæ:

FeS
Ag_2O
$PbCl_2$
As_2O_3
$CrCl_2$
$AsBr_3$
Na_4FeCy_6
$AgNO_3$
$Na_2S_2O_3$
$CuCy_2$
$FeSO_3$
$AgCN$
$SnBr_2$
$CdSO_4$
ZnS
$CuCl_2$
FeO
As_2S_5
Sb_2O_5
$BiCl_3$
$AgCyS$
$SnCl_4$
K_3AsO_4
$(NH_4)_2SO_4$
NH_4Cl
$Na_2C_4H_4O_6$
$Sn(BrO_3)_2$
$Hg(CN)_2$
$Co(NO_3)_2$
$Mg_3(PO_4)_2$
$Cu(OH)_2$
$Sn_3(PO_4)_4$

Additional Rules of Nomenclature.—In addition to the methods already given numerous other ways of indicating chemical composition are in use. One of the most common is by the use of prefixes derived from Latin and Greek numerals. Among the more important of these are the following:

Proto, meaning the first of a series, as protochlorid of tin, protosulfate of iron, etc.

Deut or Deuto, the second of a series of compounds, as deutoxid, deutochlorid.

Mono, meaning one atom of the element to whose name it is prefixed, as monosulfid, monoxid.

Bi, or Bin, indicating two atoms of the element to whose name it is prefixed, as bichlorid of mercury, biniodid of mercury, etc.

Di, practically the same as the last, as dichlorid, dichromate.

Tri, three atoms of the element to which it is prefixed, as trioxid, trichlorid.

Ter, same as the last, as tersulfate, ternitrate.

Tetra, four atoms of the element to which it is prefixed, as tetroxid, tetrachlorid.

Penta, five atoms of the substance indicated, as pentoxid, pentachlorid.

Other Greek and Latin numerals may be used in the same manner.

The following examples of the use of numerals in naming chemical compounds are taken from Prescott & Johnson's Qualitative Analysis, and illustrate this method of combination to good advantage.

Na_2HPO_4—disodium hydrogen phosphate.
NaH_2PO_4—sodium dihydrogen phosphate.
$Cu_5H_2(AsO_4)_4$—pentacupric dihydrogen tetra-arsenate.
$Fe_6H_3(PO_4)_4$—hexaferric trihydrogen heptaphosphate.
$Mn_5H_2(PO_4)_4$—pentamanganous dihydrogen tetraphosphate.
$Cu_8H_2(PO_4)_6$—octocupric dihydrogen hexaphosphate.
$Zn_5(OH)_6(CO_3)_2$—pentazincic hexahydrate dicarbonate.

The student should study these examples until the principles involved become perfectly clear.

Other words of occasional use are as follows:

Sub, meaning under, as suboxid, an oxid below the normal or ordinary oxid.

Hyper, meaning beyond, as hyperoxid, an oxid above the normal. Nearly opposite in meaning to hypo.

Super, practically the same as hyper, as superoxid.

Sesqui, the ratio of one to one and a half, as iron sesquioxid, Fe_2O_3.

Ortho, true or normal, as sodium orthophosphate, Na_3PO_4, the true or normal sodium phosphate.

Meta, similar to or derived from, as sodium metaphosphate, resembling or derived from the orthophosphate.

Para, similar to or a modification of, as paraldehyde, a modification of ordinary aldehyde.

Pyro, from the Greek for fire, meaning produced with the aid of heat, as pyrophosphoric acid, made by heating the normal or orthophosphoric acid.

Variations in Nomenclature.—The student who has carefully followed the preceding pages will have observed that the nomenclature here laid down differs in many respects from that commonly used. For example, the compounds properly named potassium nitrate and potassium chlorate are commonly known as nitrate of potash and chlorate of potash. The word potash is properly the name of the base KOH, of which the metal is potassium. The salts named contain only the metal and hence are potassium salts, not salts of potash. Similar incorrect expressions are carbonate of magnesia for magnesium carbonate, carbonate of lime for calcium carbonate, etc.

The Pharmacopoeia also sins against the approved rules of nomenclature in numerous instances. Under the name of Arsenous acid it includes the compound As_2O_3, and under the name of Chromic Acid the compound CrO_3, both of which are anhydrids, and not acids. Under the title Carbolic acid it includes an organic compound known to chemists as Phenol, and having a constitution analogous to the alcohols.

The pharmacopœial nomenclature of some of the salts of the alkaloids is also peculiar. As stated in an earlier paragraph, the alkaloids combine with acids without eliminating the basic hydrogen of the latter, i. e., the alkaloid molecule and the acid molecule are simply added together to form the salt. For the salts of the alkaloids with hydrochloric and hydrobromic acids the Pharmacopœia has adopted the singular title of *hydrochlorates* and *hydrobromates*, which, if they mean anything, mean that they are salts of chloric and bromic acids. Obviously the terms should be hydrochlorid (or —ide), and hydrobromid (or —ide), which would express both the fact that the compounds were salts of hydrochloric and hydrobromic acids, and that the hydrogen of the acid had not been eliminated.

A name frequently observed in old books and on some modern labels is that of "sulphuret," as sulphuret of iron, bisulphuret of carbon, etc. This is simply an old expression for the modern name of sulfid, which should be substituted for it.

Several years ago the American Association for the Advancement of Science recommended, among other things the dropping of the final *e* in the names of the halogens, chlorin, bromin, etc., and the binary compounds, and the changing of *ph* in sulphur and phosphorus to *f*. The changing of —ide to —id is of especial benefit because of the liability to confusion in speaking with words ending in —ite. The old spellings are, however, perfectly proper at the present time and will doubtless be in use for many years yet.

Use of Symbols and Formulae in Writing and Speaking.—Symbols and formulæ have certain and important uses in chemistry and pharmacy, but they are not intended to take the place of the names of the elements and compounds in writing and speaking. It would commonly be considered bad form to order chemicals from a wholesaler by their symbols or formulas, unless where there are different compounds having the same or nearly the same name. In such cases the formula should be used in *connection with the proper English title*, to indicate the particular compound wanted. So, also, it is generally bad taste to use the symbols and formulæ in conversation, as for instance to say, "I dissolved 5 grains of I in a fluid ounce of H_2O with the aid of 10 grains of KI."

The use of symbols in prescriptions is likewise of questionable propriety, unless by their addition to the written names they aid in fixing the identity of the article wanted.

LECTURE NO. 10.

Pharmaceutical Physics.

Pneumatics Continued. Mass and Volume Relations.

Torricelli's Experiment.—That the atmosphere really does possess weight can be shown by Torricelli's experiment. A glass tube, closed at one end, is filled with mercury, the open end closed with the thumb, the tube inverted and the open end dipped under mercury contained in a vessel. The pressure of the atmosphere will maintain the liquid in the tube. (Fig. 20.)

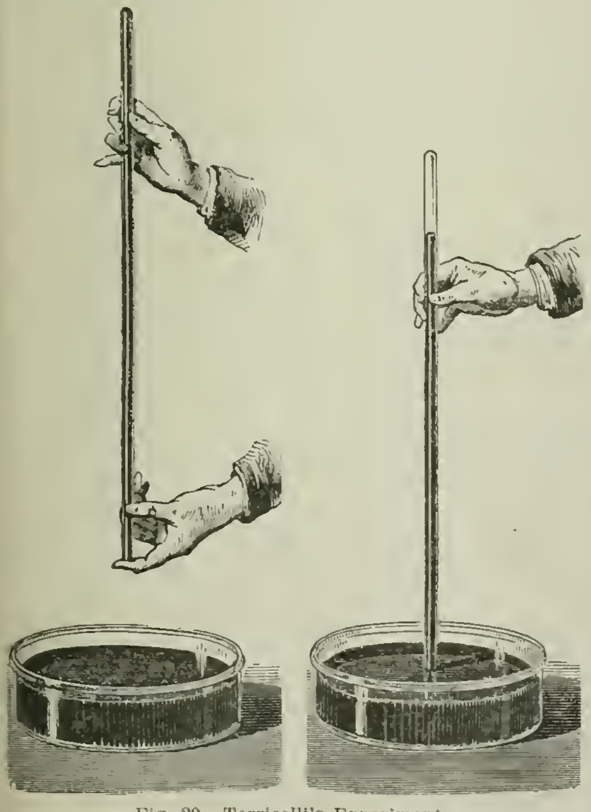

Fig. 20.—Torricelli's Experiment.

That it is the air pressure which sustains the column can be proved by placing such an apparatus of smaller size under the receiver of an air pump and exhausting the air, when the mercury promptly falls out of the tube.

The Barometer.—Such a tube of sufficient length and fastened with its mercury cistern to a suitable support constitutes the mercurial barometer in its simplest form. (Fig. 21.) The mercury cistern (concealed in the figure) being left open to the air, variations in the pressure of the latter will be indicated by corresponding elevations or depressions of the mercury column.

Other liquids might be used in the barometer instead of mercury, the only advantage of the latter liquid are its greater weight, whereby a shorter tube may be used, and its low freezing point. Water would not only be liable to freezing, but the column would have to be 34 feet high.

The Aneroid Barometer, which has the advantages of occupying smaller space and of portability, consists of a corrugated metallic box from which the air has been partially exhausted. The box alternately contracts and expands with the variation in atmospheric pressure, and in so doing causes the movement of a pointer over a graduated dial. The Aneroid must, of course, be standardized at the factory by comparison with an accurate mercurial barometer.

That the air is greatly condensed in its lower layers is shown by carrying a barometer up a mountain side. At an elevation of three and a half miles, the column will fall to one half its length, showing that one-half of the whole mass of the atmosphere lies below that level.

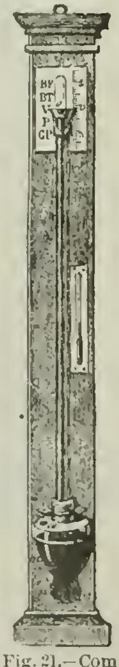

Fig. 21.—Common form of Barometer.

Standard Pressure.—Since the volume of a gas varies greatly with the pressure, it is necessary to adopt a standard pressure to which all volumes may be calculated. For this there has been selected the average height of the mercury column at the sea level, or 760 millimeters. Since a column of mercury one square cM. in cross section, and 760 mM. high weighs 1.033 Gm., the latter expresses the average sea level pressure of the atmosphere on each square centimeter. This is approximately equivalent to 14.7 pounds to the square inch. High pressures are commonly reckoned in "atmospheres." Thus five atmospheres means five times the standard atmospheric pressure.

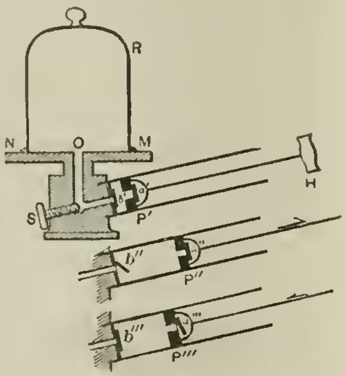

Fig. 22.—Principle of the Air Pump.

The Air-Pump.—An important aid in the study of atmospheric pressure and its effects upon other material is the Air Pump. (Fig. 22.) In its most common form this consists of a piston working up and down in a cylinder, the latter being connected by a tube with a smoothly ground plate over which a glass vessel or "receiver" is inverted. At the junction of the pump barrel there is a valve and in the piston another, both of which open upwards. When the piston is raised, it tends to create a partial vacuum below it. This releases the pressure on the air in the receiver, part of which rushes out through the open valves into the pump barrel. When the piston starts to descend, the lower valve falls into place, preventing return of air to the receiver, while that in the barrel escapes through the valve in the piston. This operation may be continued until the expansive force of the air in the receiver is no longer sufficient to raise the air valve in the pump, when the exhaustion closes. By the use of mechanically moved valves, the exhaustion can be carried to a much higher degree, but can never be complete.

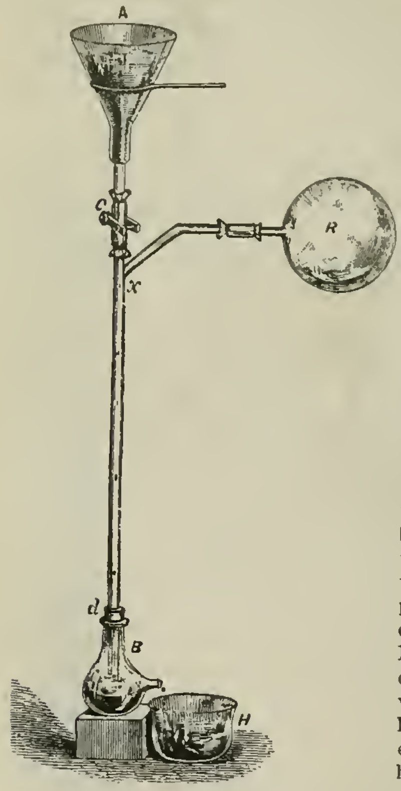

Fig. 23.—Sprengel's Pump.

The Mercury Pump.—Where very high vacua are required it is common to make use of a mercury air pump, one of the most simple forms of which is known from its inventor as the Sprengel pump. (Fig. 23.) In this apparatus a column of mercury falls through a glass tube, to the side of which is attached a connection with the vessel to be exhausted. The mercury column in falling tends to break into cylinders, and the air of the attached vessel expanding to fill the spaces between these cylinders is swept by them down and out of the tube. A modification of this pump can be operated with water instead of mercury, where there is sufficient fall. The exhaustion is always very slow with pumps of this type.

Pharmaceutical Applications.

Some form of the Sprengel pump, operated either by mercury or water, might be used to advantage in certain pharmaceutical operations. In chemical assay work it is common to use these pumps to hasten filtration, the funnel being connected at the bottom with a flask attached to the lateral tube of the pump. The air being exhausted from the flask, the pressure of the air above hastens the passage of the liquid through the filter to supply the vacuum. In such cases the apex of the filter must be supported or it will rupture under the pressure.

A similar arrangement might be made use of to hasten the process of percolation.

The Lift-Pump for Liquids.—If the lower end of the air pump first described be connected with a vessel of water, it will raise and deliver that liquid instead of air, provided the vessel from which the water is drawn is open to the atmosphere. A delivery spout is attached near the top. (Fig. 24.) The admission of air to the surface of the water is necessary, since it is the pressure of the atmosphere which forces the water up the pump stock to fill the vacuum which would otherwise be created by raising the piston. What is popularly attributed to a mysterious power of "suction" is due wholly to the atmosphere pressing on the surface of the water around the pump. If the latter were inserted into a barrel, and the barrel closed against ingress of air, it would be impossible to draw out the liquid.

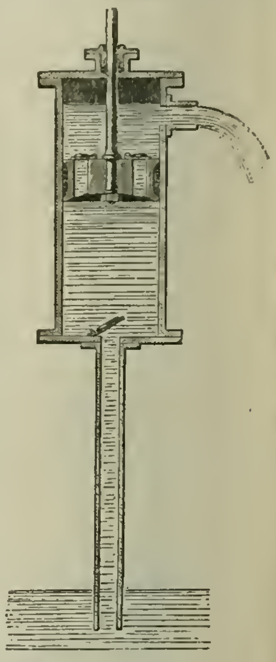

Fig. 24.—Lift Pump for Liquids.

Since the column of water is lifted by air pressure, it follows that the lift pump will not work if the distance from the piston valve is greater than the length of the water column which the atmosphere can sustain. This at the sea level, is 34 feet, but in actual practice it is not possible to make the distance so great. If the water is lifted to a greater height, the force pump is employed.

The Force Pump.—The force pump differs from the lift pump in having a valve in the side of the pump barrel instead of in the piston. When the barrel has been filled the downward thrust of the piston forces the liquid out of this side valve. (Fig. 25.) With such a mechanism the liquid is delivered in spurts with each stroke of the piston. To regulate the pressure and make the delivery in an even stream, it is usual to add a hollow chamber the upper part of which is always filled with air. The water being forced into this chamber against the air the latter is compressed, and in expanding keeps up the pressure until the delivery of the next stroke.

The Siphon.—Another instrument which finds use in pharmacy is the siphon. (Fig. 26.) This is in shape like an inverted U, usually with one limb longer than the other. The siphon having been filled, one limb is immersed below the surface of the liquid to be drawn off,

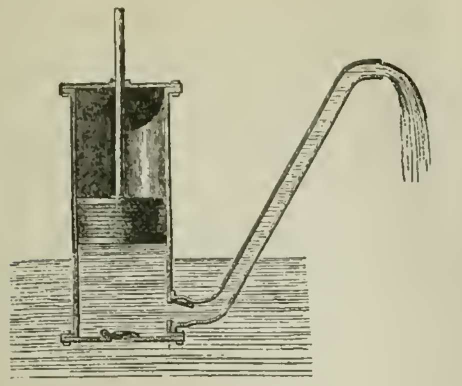

Fig. 25.—The Force Pump.

and the other allowed to project over the side of the vessel. Under such circumstances a flow will take place through the siphon, and continue until either the surface of the liquid attains the same level in both vessels, or until it is drawn off below the opening of the limb through which it enters.

The action of the siphon is due both to gravity and to the pressure of the atmosphere. Both legs being filled with liquid, that in the longer leg is consequently the heavier and determines the direction of the flow. If, however, gravity alone operated the cohesion of the liquid would not be sufficient to prevent the column from breaking in two at the bend and each leg emptying itself. This is prevented by the pressure of the air which keeps the siphon filled. If the siphon be very small, so that cohesion is sufficient to hold the liquid column together, the flow will continue even in a vacuum.

As the short leg is kept filled with liquid by atmospheric pressure, it follows that the liquid cannot be lifted over 34 feet. In practice the siphon will not work successfully even near the limit. If a heavier liquid than water is to be moved, the perpendicular distance must be as much less than 34 feet as water is lighter than the liquid. For example, with mercury the distance would have to be less than 76 cM. In every case the liquid must be delivered to a point below the surface in the vessel from which it runs.

Pharmaceutical Application.

In pharmacy the siphon finds application in drawing off liquids from sediment which it is desired not to disturb, in the handling of acids, etc. The siphons used for this purpose may be glass, metal, rubber or stoneware. For general purposes a rubber tube serves excellently. Commonly the siphon is filled by suction. Some convenient siphons for moving corrosive or poisonous liquids have a pump attachment for filling.

The Atomizer.—Another apparatus of pharmaceutical importance is the common atomizer, an instrument for producing a fine spray of perfume or medicinal solution. It consists of a bottle to hold the solution, and furnished with a rubber bulb which by compression directs a blast of air across the open end of a tube extending into the liquid. The current of air by adhesion draws the air out of the tube which then fills with liquid and this as it leaves the tube is caught up and driven into fine spray by the issuing blast.

Mass and Volume Relations.

In the preceding studies the masses of objects have been considered without regard to the amount of space occupied, and volumes have been considered without regard to their masses. When these two qualities are considered in connection certain new and interesting relations appear, some of which are of great importance in practical pharmacy.

Flotation.—When a solid body is placed on a liquid one of three things may occur: It may sink to the bottom, float indifferently at any point, or rest on the surface with only its lower portion immersed. Which position it takes depends upon the relation of its weight to that of an equal bulk of the liquid. If it is heavier than an equal bulk of the liquid, it sinks. If it is just as heavy, the effect is the same as the addition of so much of that liquid, and it will consequently float wherever placed. If the solid is lighter than an equal bulk of the liquid, it will sink just sufficient to displace its own weight.

Loss of Weight, Principle of Archimedes.—If a piece of metal be first weighed in air, then attached by a thread to the balance beam, immersed in water and again weighed, it will be found to have lost in weight, i. e., that it is buoyed up by the water. (Fig. 27.)

What is the amount of loss in weight? It is evident that the metal displaces its own bulk in the liquid. If the experiment be made in a graduated jar, and the amount of rise in the liquid noted when the metal is immersed, then that quantity of liquid poured out and weighed, its weight will be found to be the weight which the metal has apparently lost. No matter how often the experiment be tried the result will be the same. It is evident, therefore, that when a solid is immersed in a liquid, its *loss in weight is equal to the weight of an equal bulk of the liquid.*

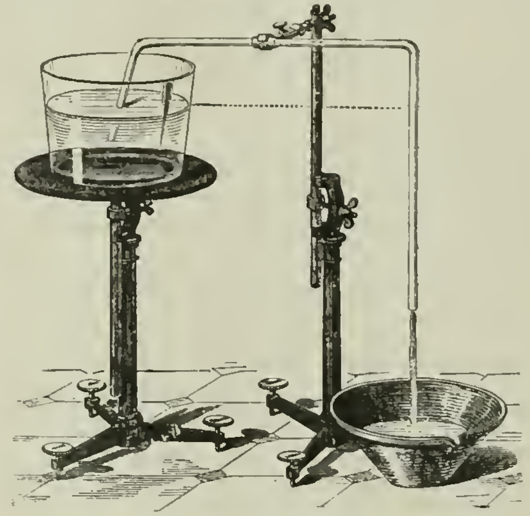

Fig. 26.—The Siphon.

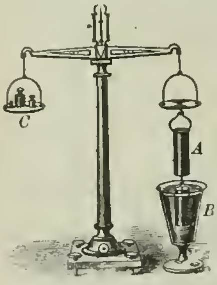

Fig. 27.—Weighing in Water.

This is known as the principle of Archimedes, and must be thoroughly comprehended by the student before the subject of specific gravity can be properly understood.

Density.—If we should compare equal cubes of iron, lead, coal, wood, etc., it would be found that, though equal in volume, they possess quite different weights. This is owing to the fact that they contain different quantities of matter in the same space, or that they differ in density. Hence density is defined as *the quantity of matter in a unit of volume.*

If metric weights and measures are used, then the density of a given substance is the number of grams in a cubic centimeter, and has the same numerical expression as specific weight.

Specific Density and Specific Weight.—Specific density is the ratio of the density of a body to the density of a standard substance. The abstract number which expresses this ratio is specific weight, better known as specific gravity. It indicates the number of times the substance considered is heavier than the standard substance. Specific weight, or specific gravity, is commonly defined as the ratio of the weight of a body to the weight of an equal volume of a standard.

For liquids and solids the standard substance is water. Either air or hydrogen is used as the standard for gases.

The distinction between specific density and specific gravity is this: Density is a concrete number, representing a definite number of units of mass in a unit volume, as grams in a cubic centimeter. Specific density is an abstract number, expressing a ratio, without regard to any particular volume or mass. The numerical expression is the same for both. When considered in a concrete sense it expresses density; when considered as an abstract ratio, it expresses specific weight.

Specific Volume.—The ratio of the volume of any substance to the volume of an equal weight of a standard substance is known as specific volume, a term suggested by Prof. Oldberg. It is just the reverse of specific weight. In determining the latter we take *equal volumes* of the substance and the standard and compare their weights; in specific volume we take *equal weights* and compare their volumes. Like differences in specific weights differences in specific volumes indicate differences in qualities.

The higher the specific volume of a substance, the lower will be its specific weight. As a consequence the product of the two will always be a constant quantity, i. e., unity. It follows, therefore, that 1 divided by S. W. will give S. V., or vice versa.

$$\text{S. W.} \times \text{S. V.} = 1, \text{ or } \frac{1}{\text{S. W.}} = \text{S. V., or } \frac{1}{\text{S.V.}} = \text{S. W.}$$

Water is also the standard for specific volumes.

Determination of Specific Weights and Volumes.—The practical methods employed in determining specific weights and volumes are better considered under pharmaceutical processes.

Standard Temperatures.—Since the volumes of bodies, and consequently their densities, vary with the temperature, it is necessary that some particular temperature be adopted as the standard.

For purely scientific investigations this is usually taken as 4° C., which is the temperature of water at its greatest density. The standard adopted by the U. S. Pharmacopœia is 15° C. for both the standard and the substance whose specific weight is to be taken. Some of its tables, however, are based upon a temperature of 15° C. for the substance and of 4° C. for the standard.

Practical Studies.

1. Perform the experiment of Torricelli, using water if mercury is not available.

2. Fill a thin soda tumbler to the brim with water. Lay over the surface a square of thin, stiff paper, hold the paper against the tumbler with the left hand, and with the right hand invert the tumbler. (See Fig. 28.) What holds the water in the tumbler? Why is the paper necessary? What sustains the liquid in a pipette?

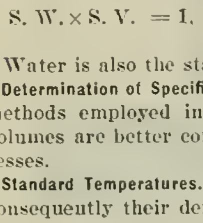

Fig. 28.—Tumbler Experiment.

3. Prepare a siphon by bending a glass tube of small diameter, or use a rubber tubing instead. Place one end under the glass and catch the water delivered in a second glass. What occurs when the water reaches the same level in both? Raise the second vessel until the surface of the water in it is above that in the first vessel. What now takes place?

4. Is there such a principle or force as "suction?" Partly fill a narrow tube, closed at one end, with water. Apply to the mouth and attempt to draw the liquid out of the tube by suction. Why do you not succeed? What would be the effect if there was an opening in the bottom of the tube?

5. Using an apparatus like Fig. 27, weigh some solid, as a lump of coal, first in air, and then in water. How much weight is lost? Place some water in a narrow graduated vessel, note where the water stands, place in it the solid, and observe how much the water rises. Pour out the increased volume of water. Weigh it and compare with the loss in weight previously set down. (Unless carefully performed with the aid of an accurate balance, some discrepancy will appear in the two weights.).

A fairly good balance for use in such experiments can be made by suspending a pine ruler on a pin thrust through the middle. The pans can be squares of cardboard, suspended by strings from the ends of the beam.

TO ERA COURSE STUDENTS.

Do not fail to give address and matriculation number every time you write.

Whenever possible recitation blanks will be sent some time in advance of the lectures, so as to give students the benefit of having them in hand when the lectures are received.

In returning recitations, the answers to at least two lectures should be sent in at once.

Make your answers brief and explicit. The better the lesson is understood the fewer words will be required to explain it.

Do not ask questions about points not considered in the lectures. Most of the explanations asked for thus far upon matters which will be treated of later.

Questions requiring a special reply should always be accompanied by return postage.

Make a special inquiry at the post office before complaining about non-receipt of quizzes, etc. A number of letters from the director's office have been returned by post masters marked "unclaimed."

CORRECTIONS.

Under Abbreviations, page 335, the abbreviation for Kilometer should be KM, not Km, as printed.

Under Writing and Reading Metric Quantities, same page, instead of 9.075 M. read .975 M.

TEXT BOOKS ON PHYSICS AND CHEMISTRY.

For students who desire to extend their studies in chemistry and physics, any of the following text books will be found sufficient. Only one book on each subject will be necessary. The books may be obtained from any general book dealer or from D. O. Haynes & Co., 106 Fulton street, New York:

Physics.

Cooley's Student's Manual of Physics or Appleton's School Physics, each $1.25; American Book Co., New York; Gage's Elements of Physics, $1.25, Ginn & Co., Boston; Barker's Physics, $3.50, Henry Holt & Co., New York.

Chemistry.

Attfield, Manual of General, Medical and Pharmaceutical Chemistry, $2.75; Lea Bros. & Co., Philadelphia; Fownes' Chemistry, 12th edition, with Watt's Inorganic Chemistry, $2.75, Lea Bros. & Co., Philadelphia. Simon, Manual of Chemistry, $3.25, Lea Bros. & Co., Philadelphia; Bartley, Medical Chemistry, $2.75, P. Blakiston, Son & Co., Philadelphia; Sadtler & Trimble, Pharmaceutical and Medical Chemistry, $5.00, J. B. Lippincott Co., Philadelphia; Beal, Notes on Equation Writing and Chemical Arithmetic, 75 cents, D. O. Haynes & Co., New York.

Druggist.—Pills, my dear?
Little Girl.—Yes, please, sir.
Druggist.—Antibilious?
Little Girl.—No, sir. Uncle's bilious.

MEDICAL APHORISMS FROM "AKESIOS."

"Who was Akesios?" asked the old bookman as he led the writer into his place of business a few weeks ago. "What! You a student of medical literature and you do not know? Where is your Greek, anyway? Ah, this age! It turns its back upon some of the best and noblest thought of the past. It forsakes the classics and follows hard after the god 'commercialism.' Its representatives reserve but little time for intellectual discipline." And the old fellow dropped into a reverie, musing, perhaps, of other days, before the advent of this intense "commercialism," when he was wont to regularly worship at the shrines of ancient learning and thought. Recovering himself, for he was "commercial" enough when a prospective sale was in view, he continued:

"Akesios, or the Healer, was one of the names by which the Greeks designated the demigod whom the Egyptians called Harpocrates. His birth, which was placed in the winter solstice, indicated the feebleness of the wintry sun, while it left hopes, also, of his return in spring to spread new life. Thus was the god at once an emblem of the infirmities of the sick, and of their hopes of recovery. He was also depicted holding his finger to his lips, symbolizing that sacred silence concerning the mysteries of medicine ever required of the initiated." And the old man talked so earnestly and intelligently, he had gained the attention of his auditor, the very opening for which he was seeking. That there was method in his manner of procedure, was plain. He had used intellectual diplomacy to gain the ear of a customer whose money meant more to him than the gratification of having done a good deed in disseminating knowledge where he doubtless thought it was badly needed.

"Now, here is a book I think you will appreciate," and he fished out of a collection of old medical works a translation of "Akesios," the original of which was published in Göttingen in the first half of the century. The old bookman was well posted on medical lore and as he handed the book over he talked very entertainingly and learnedly about the "twelve eminent deceased members of the medical profession to whom as many letters were addressed by the author," each letter being selected with reference to certain circumstances in the character and history of the one addressed. For such was the general character of the book. The old man possessed a retentive memory, and as he recounted incidents in the lives of Dr. James Gregory, Lettsom, Tulpius, Desgenettes, Herman Boerhaave, and a host of other worthies whose names were familiar to the reader of medical literature in the early part of the century, it was plain that he knew his subject well.

"This book, that is the original, was written by one Prof. K. F. H. Marx, and published, as I have told you, at Göttingen. It is a sort of treatise on medical ethics and it will please you with its epigrammatic style. As you are an apothecary you will especially appreciate the aphorisms addressed to Dr. Albert Thaer, who died in the early part of the century. Thaer, you know, was at one time physician in ordinary to old George III., king of England who afterward went insane. These aphorisms, in the original work, extend to forty-five pages and each one of them conveys some useful and ingenious remark. Many of them are medical puns, the point of which is entirely lost by translation. Let me point out some of them for you," and he handed over the book with the following passages among those he had checked:

"Death, like the apothecary, gathers roots in the spring, flowers when they are fully blown, and fruits after they are fully ripe."

"To gild the pill is out of fashion, but it is still necessary to gild the palm."

"Physicians who love system, often systematically follow small ends."

"Many consciences sleep without opiates."

"The practitioner who has had most experience is Time, and the medicine which is easiest to take is Patience."

"Many a one has nothing holy about him except the os sacrum."

"Much drink drowns health."

"In the world, as in the laboratory, our part is to analyze and to determine accurately individual objects."

"Lunar caustic is white, but blackens; the hypocritical countenance smiles openly, but blackens privately."

"The rich have an idiosyncrasy, not against devils but against poor devils."

"It is with principles as with copper-plates; after a time they wear out."

"As many roots and flowers are more powerful dried than in their fresh state, so the influence of many men is greater after their death than during their lives."

"The more the directions of a physician resemble pastoral letters rather than police regulations, the less will they be followed."

"It is as difficult in general to decide what is truth and what is folly, as what is physic and what is poison."

"Let him who desires to secure valuable papers deposit them between the pages of the folio work of some pretended scholar. He may rely on no one disturbing them."

"A memory which treasures up what has already been found injurious is the best of preservatives, and in many cases far more valuable than weighing sophistical reasoning."

"Men think more of those who give them gold than of those who give them health."

"Kind words do in life what honey does in an electuary, they bind heavy immiscible things together."

"Medicine has for centuries served as a prop to natural science, a benefit which the latter has repaid by making the other feel its superiority."

"Powerful minds, like the American aloe, attain their youth in old age."

"As fluids stand highest in the smallest capillary, so the emptiest head carries itself over the highest."

"The galvanic column is Galvani's pillar of fame."

"Painful experience, like narcotic poisons, make us cold."

"A man may be known by his style. He stamps his eternal image upon it; but such a picture, faithful as it may be in resemblance, is but seldom successful and interesting."

"A physician who writes anything but professional formularies makes himself conspicuous. Writings which are not clothed in the form of prescriptions will neither gain due consideration or regard; such persons appear to disregard the warning of the god who stands beside Æsculapius, for is not the finger which Telesphorus holds to his lips the writing finger?"

"The best regulation for the medical profession consists in dignified humanity; this will prescribe, in the simplest manner, its relation to the State, to science, to the public and to the university. Pure morals, able qualifications, thorough cultivation, are the safest guides."

"If there isn't a sermon in the last paragraph, then I never read one," said the old gentleman as he proceeded to wrap up the book.

"By the way,"he continued, "the aphorism was used by writers a great deal more years ago than it has been since the advent of newspapers and reporters. You fellows might profitably study the axiomatic expressions of these older writers for style. From the earliest times the Greek philosopher employed this method of expression in the dissemination of ideas and many of the principles and important doctrines in science and philosophy have been perpetuated in these terse statements. Indeed, one of the best specimens of a philosophical treatise wholly written in aphorisms is the 'Novum Organum' of Lord Bacon. As you are particularly interested in medicine, I may add that the word has been used as the title of some well known works—as the 'Aphorisms of Hippocrates,' the 'Aphorisms of the School of Salerno' and the 'Aphorisms of Boerhaave.' These works represent respectively the medical doctrines of the 5th century B. C., and the 12th and 17th centuries of the present era. From the three ancient commentators on Hippocrates we get a definition of an aphorism which is as applicable to-day as it was when first penned, 'a succinct saying comprehending a complete statement,' a definition, by the way, which is supplemented by a modern lexicographer with the explanation—'a saying poor in expression, but rich in sentiment.' "

The information was worth the "price of admission." The reporter took the book and thoughtfully wended his way homeward.

The Kremlin, Moscow.

(Special to the Era.)

PHARMACISTS AT MOSCOW.

The twelfth International Congress, under the "high protection" of the Czar, was formally inaugurated by the Grand Duke Serge at the Imperial Theatre of Moscow on Aug. 19, when speeches were made by M. Lannelongue, of Paris; Mr. Lauder Brunton, of London; Professor Virchow, of Berlin, as well as by their Russian hosts.

The proceedings were, of course, mainly medical; but, thanks to the energy of Professor Tichomirov, Professor of Pharmacy at the Moscow University, a section of pharmacy and pharmacognosy was organized. Its five well-attended sessions were successively presided over by M. Tichomirov himself; Professor Tschirch, of Berne, Switzerland; Professor Verne, of Grenoble, France; M. Bourquelot, of Paris, and M. Belohanbeck, of Prague, Bohemia.

THE PHARMACY SECTION.

The meetings were held at the University, and, though the Russian element naturally predominated, the French and Germans were in full force. The English and Americans were principally conspicuous by their absence in this section. The papers were mostly read in French, and (possibly as a delicate compliment to the new "alliance") the printed matter was edited in the same language. The discussion, however, mostly took place in German. M. Tichomirov read a paper by Professor Moeller on Storax, which, he states, is a pathological product, and not a physiological secretion. Professor Verne described his method for dissolving tar in water, and repeated the observation he recently made at Paris on pharmaceutical education. He thinks study should precede, and not follow, practical shopwork. M. Collin, of Asnières, France, insisted on the utility of micrography in the study of materia medica, and gave an interesting description of the difference between illicium religiosa and illicium anisatum. M. Thoms, of Berlin, described a new bark from one of Germany's African colonies, while Professor Tschirch spoke of the "Excretions of Plants" and "Seeds Containing Atropine." Other papers were by Professor Tschirikoff on the preparation of bitter almond water; M. Vaudin, of Fécamp, on cinders in milk analyses; Professor Davidoff, of Warsaw, on Ephedra Vulgaris; M. Kresling and Professor Poehl, on serotherapic and organotherapic preparations, and Professor Bourquelot, on poisonous mushrooms (Amanita phalloides, etc.). Dr. Hans Heger, of the Vienna Pharmaceutische Post, also took part in the various discussions, while Professor Poehl rendered valuable service as interpreter, and joined in the discussion on

The International Pharmacopœia.

Professor Bourquelot thinks that if absolute uniformity is not practicable for some time to come, each country might pave the way by modifying any glaring discrepancies which exist between its own codex and the formularies of foreign nations. For instance, French and Belgian formulas for syrup of iodide of iron contain ½ per cent. of iodide, while the Danish and United States Pharmacopœias give 10 per cent. Again, the tinctures of opium, ipecac, etc., in the French codex are twice the strength of those specified in the Swiss and Italian Pharmacopœias. M. Bourquelot, by the way, seems to think the United States Pharmacopœia a remarkably well drawn up work, superior to any European formulary, though he ranks the Swiss as a good second.

In the Other Sections

we may just note, "The Bacteriological examination of drinking water, with especial reference to typhoid fever," by Professor Victor C. Vaughan, of Michigan, U. S. (Hygiene Section); the "Serotherapeutics of Tetanus," by M. Nocard, and "Urinary Acidity and the best methods for its determination," by M. Berlioz, the well-known Paris pharmacist (Section of Physiological Chemistry). Professor Metchnikoff, of the Paris Pasteur Institute, read a paper on "The Plague," which was received with applause, which proved that the prophet is not always without honor in his own country.

The Moscow Pharmaceutical Society

received the delegates in solemn session on the 24th, and afterward offered them a cold lunch, served in the Russian style. M. Ferrein also offered a pleasant little dinner to a select body of pharmacists, and invited them to spend an afternoon in examining his laboratories and factories; while a subscription dinner was held on the 25th.

The free railway passes offered by the Russian Government to all congressists filled Moscow with trippers from across the frontier, many of whom took but little active interest in the Congress. The temperature (about 90° in the shade) was hardly conducive to indoor work, especially as the quaint Slavonic old city, so different to the modernized European capitals, is a charming place for the tourist. Thoroughly Russian in language as in appearance, the great difficulty was to find interpreters and guides; the Moscow students, in their characteristic costume, did what they could to render service to the bewildered foreigners of the Congress.

Hotel De Ville, Moscow.

Hotels and Traveling.

At Warsaw we spent two hours finding a hotel which had a room unoccupied. At Moscow we had secured a room beforehand; a vast apartment, divided into sitting room, bedroom, etc., by wooden partitions seven feet high; a huge stove in the center could thus warm the whole in winter. The railway carriages are comfortable enough, but one fails to understand the absence of dining cars. On a 30 hours' journey we had to snatch such hasty refreshment as could be obtained at buffets, excellently furnished, during stoppages which never exceeded ten minutes. The scenery was monotonous, and the country parched by two months' drought.

St. Petersburg

was visited by many of the congressists. We were officially received at the Town Hall, and shown over the Peterhof Palace, which President Felix Faure had so recently quitted. Others toured as far as Nijni Novgorod and Sebastapol.

Paris in 1900

is to be the scene of the next Congress. M. Lannelongue will preside.

PRACTICE AND OWNERSHIP IN PHARMACY.*

BY JOSEPH JACOBS.

I have been requested to "define what constitutes the practice of pharmacy," and also to "define and distinguish between to own, open, operate, manage, conduct, direct or supervise a pharmacy. Which, if any, of these provisions should be enjoyed by non-pharmacists?"

A definition of the phrase "the practice of pharmacy," in its widest signification, would be the doing of those acts which constitute the business or avocation of a pharmacist. These acts would be co-extensive with the whole range of conduct lawfully permitted to and enjoyed by a person in society in procuring, preparing and furnishing to others any article, medicine, preparation, compound or appliance to be used for the cure, alleviation or prevention of pain or disease, or individual deformity, or disfigurement in any animate being. But, practically, the practice of pharmacy is the art and avocation of procuring and collecting together of such articles of a medicinal nature and furnishing them for a price to the individuals who need and will use them medicinally. And, I take it, that the intention of the question propounded is really "What acts should be allowed to pharmacists and prohibited to non-pharmacists by the State?"

To answer this question we must inquire what is the reason or necessity for any law on the subject at all, for all laws to be effective and worthy of support should be founded in reason, and be intended to correct or prevent an evil. The evil to be prevented by pharmacy laws mainly lies in the fact that the preparation of natural substances for medicinal use requires expert knowledge and skill, and to leave such preparation to unskilled persons would hazard the lives and health of the people of the State. This is the main evil aimed at and sought to be overcome, by any pharmacy regulating statute. Another purpose is to secure to the people efficacious and unadulterated medicinal agents and substances for the cure and prevention of disease.

It will then be asked, should not pharmacy laws, to be effective in preventing the evils above-stated, be broad enough to "confine the sale or dispensing of drugs, chemicals and medicines to those alone who have proved their qualifications for such service—the registered pharmacists"—as the Committee says in its circular of questions "is the consensus of opinion?"

Now I would say that that was perhaps going too far, for there are many "drugs and chemicals" that have industrial or other uses besides those which apply to them as medicines, and to prohibit their sale by non-pharmacists to others for use in the industries and arts, would be a restriction upon trade so hurtful to the State that it would be unjust, and as well unjust to the individual citizens who might own these "drugs and chemicals," or who might wish to engage in their "sale" or "purchase and sale" for profit. We must not propose a law that is open to the objection of "class legislation," or that is more in "restraint of trade" than is necessary to the result of effecting beneficence in the nature of "police regulation" and the "preservation of health and morals."[1]

And I think that a reasonable exception should be made in favor of general merchants being allowed to keep and sell non-poisons and domestic drugs and remedies in original packages, purchased from a registered pharmacist, when those merchants have their stores at a distance of five miles or more from a pharmacy. Reasonable exceptions like this will give reasonableness to the general law, and, on the whole, prove of benefit to the pharmacists.

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*Presented before the section of education and legislation of the American Pharmaceutical Association at its last annual meeting, August, 1897.

[1] Such exemptions were provided for in the list of questions of the committee.—Chairman Section of Education and Legislation.

I have been asked to "define and distinguish between to own, open, operate, manage, conduct, direct or supervise a pharmacy. Which, if any, of these privileges, should be enjoyed by non-pharmacists?"

The distinction between "opening" a pharmacy, "conducting," etc., is indicated ex vi termini, as the lawyers say. No one would "open" a pharmacy without the intention of "operating" it, so there could be no profit in discussing the distinction, and a non-pharmacist should not be allowed to "open" because be might attempt to "operate," and then the damage would begin. It is against the law in our State to point even an "unloaded" gun at another.

To "operate, manage, conduct and supervise" are terms of such close kinship in meaning that they are nearly, if not quite, of the same intent. They practically mean the same, and all should apply to non-pharmacists.

But I would urge objections to restricting non-pharmacists from "owning" a pharmacy. The reasons are numerous why they should be permitted to "own" if they wish, but there are two which it seems to me are conclusive.

In the first place, the law which attempted to prevent a non-pharmacist from owning a drug store would be held to be unconstitutional, since the right to hold and enjoy property in any kind of valuable goods is inherent and fundamental. Let the non-pharmacist hold and own a pharmacy if he wishes, subject to the laws regulating the manner in which he makes a sale of the articles comprising it.

In the second place, our pharmacists as owners themselves, do not wish to hold their property as property which, as a whole, cannot be bought by any one in the trading world. Such a tenure would lessen the value of their property as an investment, should they desire for a good reason to sell or change their business. And many of our profession are vastly benefited by being enabled to employ the capital of non-pharmacists, who, as actual or silent partners, or as holders of shares in joint stock companies, are co-owners with us in the business.

I trust that the great work which the committee is performing may be appreciated by the pharmacists, and that the "Uniform Law" which it may be able to suggest will meet the approval of the "sovereigns" of our land, the voters.

Atlanta, Ga., August 6, 1897.

DETECTING THE INFINITE.—It passes man's comprehension to fix upon the smallest quantity of an element which he would put into a molecule. This thought is suggested by some figures which Dr. B. Neumann has brought together respecting the detection of metals (Chem. Zeit.; Ch. & Dr.). The most easily detectable metal is lead; one part of it in 196,000,000 parts can be detected by means of sulphuretted hydrogen. Gold comes next, 1 in 100,000,000, hydrochloric acid and chloride of tin being the reagents; then we may put copper, 1 in 15,660,000 as sulphide; iron, 1 in 15,000,000 with logwood; arsenic, 1 in 3,600,000 as sulphide; zinc, 1 in 3,000,000 as ferrocyanide; and antimony, 1 in 1,500,000 by electrolysis. These are by no means the limits of detectability of the elements, as smaller amounts may be observed spectroscopically; even although not more were in this way detectable, it follows that as the element has to be distributed in the electric or other flame as gas, each incandescent particle represents a mere fraction of the amount of salt taken. The human mind cannot comprehend such a particle, yet it exists. The two-hundred millionth of a grain almost of lead can be detected, which means that the atom cannot weigh more than that; there must, indeed, be many atoms of the metal in the solution. But taking it at that, the atom of hydrogen cannot weigh more than 1-207 of 1-196,000,000 of a grain, which is incomprehensible, although it is based upon a thing which can be seen—and "knowledge of things we see."

QUESTION BOX

The object of this department is to furnish our subscribers and their clerks with reliable and tried formulas and to discuss questions relating to practical pharmacy, prescription work, dispensing difficulties, etc.

Requests for information are not acknowledged by mail and ANONYMOUS COMMUNICATIONS RECEIVE NO ATTENTION; neither do we answer queries in this department from non-subscribers.

Unanswered Queries.

H. Z., H. W., D. J. K., and others: See rules at the head of this department. We do not answer queries for anonymous correspondents or non-subscribers, neither do we answer queries by mail.

Disinfecting Books.

(H. B.) Try formalin or formaldehyde. See report of Dr. John S. Billings' experiments upon this subject, this journal, Sept. 9, 1897, page 329. After disinfection, old documents may be perfumed with oil of lavender.

Government Pills.

(F. P.) relates a little experience he had recently which may be of service to others in a like situation. He had a call for "Government Pills." It was a "new one" for him, and after looking through his large and varied assortment of patent medicines, proprietary price lists and various reference works he gave it up as a "lost job." The person then remarked that he had often purchased the pills, and after describing the box said it was marked "U. S. P., meaning U. S. Pills," and "U. S. meant the government of course." What the customer really wanted was compound cathartic pills.

Domestic Ammonia.

(C. W. T.) See this journal Sept. 9, 1897, page 340. Here are some other formulas:

(1)	Borax	120 grains
	Oil cinnamon	1 drop
	Oil cloves	1 drop
	Oil citronella	1 drop
	Alcohol	1 fl. dram
	Ammonia water	1 quart

Dissolve the borax in the ammonia and the oils in the alcohol, then mix the solutions.

(2)	Sodium carbonate	20 ounces
	Aqua ammonia	48 fl. ounces
	Water	32 fl. ounces

Mix, and after 2 or 3 days decant the clear solution.

Asbestos Mass (Cement).

(J. A. S.) Ground asbestos may be made into a mass which will stand a high degree of heat by simply mixing it with a solution of sodium silicate. By subsequent treatment with a solution of calcium chloride the mass may be made insoluble, silicate of calcium being formed.

A cement said to stand a high degree of heat and to be suitable for cementing glass, porcelain, or other vessels intended to hold corrosive acids, is this one:

(1)	Asbestos	2 parts
	Barium sulphate	3 parts
	Sodium silicate	2 parts

By mixing these ingredients a cement strong enough to resist the strongest nitric acid will be obtained. If hot acids are dealt with, the following mixture will be found to possess still more resistant powers:

(2)	Sodium silicate	2 parts
	Fine sand	1 part
	Asbestos powder	1 part

Both these cements take a few hours to set. If the cement is wanted to set at once, use potassium silicate instead of sodium silicate. This mixture will be instantly effective, and possesses the same power of resistance as the other.

Borated Talcum.

(C. W. T.) The following will probably answer your purpose:

Purified talcum, N. F.	2 pounds
Powdered boric acid	1 ounce

To perfume, add the following:

Powdered orris root	1½ ounces
Extract jasmine	2 drams
Extract musk	1 dram

A powder sometimes dispensed under this name is the salicylated powder of talcum of the National Formulary which contains in every 1,000 grams 30 grams of salicylic acid and 100 grams of boric acid.

Here is a formula which contains zinc oleate:

Zinc oleate	1½ ounces
Boric acid	2½ ounces
Talcum	4 ounces

Mix and perfume if desired.

Pectoral Syrup Containing Tar and Wild Cherry.

(J. K.) Try one of the following:

(1)	Syrup tar	64 fl. ounces
	Syrup wild cherry	45 fl. ounces
	Syrup squill	16 fl. ounces
	Fluid extract lobelia	6 fl. drams
	Deodorized tincture opium	4 fl. ounces
	Fluid extract of ipecac	4 fl. drams
(2)	Syrup of tar	13 fl. ounces
	Syrup of tolu	13 fl. ounces
	Syrup of wild cherry	50 fl. ounces
	Syrup of squill	16 fl. ounces
	Syrup of senega	6 fl. ounces
	Ammonium chloride	3½ ounces
	Morphine sulphate	15 grains
	Tartar emetic	30 grains
	Water	20 fl. ounces
	Glycerin	10 fl. ounces

Dissolve the ammonium chloride, morphine sulphate and tartar emetic in the water, filter the solution, and add the other ingredients.

Addition of Water to a Liniment.

(A. P. W.) Your liniment contains a considerable quantity of oil sassafras and gum camphor, both of which are but sparingly soluble in water, hence, the addition of a large quantity of water to the alcoholic solution containing these substances will cause precipitation. To ascertain the amount of water which may be added without causing this reaction, dissolve the oil of sassafras and camphor in about four-fifths of the alcohol directed for the formula. Gradually add water (warm, not hot) until it produces a slight turbidity, then add alcohol to complete the measure. The remaining ingredients may be added after the solution of oil and camphor is made. The addition of a small quantity of polysolve to the alcoholic solution will permit the liniment to be largely diluted with water without causing precipitation. Try a little experiment along this line.

Emulsion of Turpentine.

(C. D. S.) We cannot give the formula for the preparation you name. However, you will find two general formulas for emulsions of this character in the National Formulary, revised edition (page 51). Here is another one known as

Recaurier's Emulsion of Turpentine.

Oil of turpentine	3 fl. drams
Yolk of egg	2 fl. drams
Syrup of mint	2 fl. ounces
Syrup of orange flower	1 fl. ounce
Syrup of ether	5 fl. ounces
Tincture of cinnamon	30 minims

Make an emulsion.

Syrup of ether is a French official preparation and is made as follows:

Ether,	
Alcohol, of each	1 troy ounce
Water	2 troy ounces
Syrup	16 troy ounces

Mix in a glass vessel, having a stopcock at the lower part; shake occasionally for a week, and draw off when clear into small bottles.

Bicycle Rim Cement.

(G. D. S.) A good thick shellac varnish with which a small amount of castor oil has been mixed will be found a very excellent bicycle rim cement. The formula recommended by Edel is as follows:

Shellac	1 pound
Alcohol	1 pint
Mix and dissolve, then add	
Castor oil	½ ounce

The castor oil prevents the cement from becoming hard and brittle.

A cement used to fasten bicycle tires may be made by melting together at a gentle heat equal parts of gutta-percha and asphalt. Apply hot. Sometimes a small quantity each of sulphur and red lead are added (about 1 part of each to 20 parts of cement). Formulas for rubber cements suitable for mending bicycle tires have frequently appeared in this journal. Consult the indexes.

Pharmacy Regulations in Canada and the Klondike.

(J. R.) Pharmacy laws are in force in British Columbia, Manitoba, New Brunswick, Northwest Territories (in which part of the Klondike region is located), Nova Scotia, Ontario and Quebec. These laws are based, so far as titles and the sale of poisons are concerned, on the British Pharmacy Act. The regulations and the enforcement of the laws are under the supervision of the Pharmaceutical Society of each province, each society, in a measure, being permitted by law to prescribe the character of the examinations to be passed by applicants for registration. The examinations held by the Pharmaceutical Association of the Northwest Territories are held semi-annually, and according to a resolution passed at the last meeting of the association, they may be conducted at Calgary, Regina or Wolseley. The next meeting of the council is to be held at Regina. For particulars, fees, etc., address the registrar-treasurer, A. D. Ferguson, Wolseley, N. W. T. There is no pharmacy law in the American territory, Alaska.

Cough Syrup.

(C. J. F.) asks how to make a clear preparation from the following:

Wild cherry bark	22 ounces
Ammonium chloride	8 ounces
Fluid extract of ipecac	½ ounce
Oil bitter almond	8 drops
Vinegar of squill	16 ounces
Sugar	40 ounces
Glycerin	1 pint
Tincture tolu	2 ounces
Tar water, enough to make	1 gallon

Reduce the wild cherry bark to a coarse powder (No. 20). Thoroughly moisten with sufficient tar water and macerate for about 24 hours in a closed vessel; then pack in a cylindrical glass percolator and gradually pour upon it tar water until about 64 ounces of percolate have been obtained. Dissolve the sugar and ammonium chloride in the percolate by agitation without heat, add the glycerin and strain. To the product add the fluid extract of ipecac, vinegar of squill, and the tincture of tolu (Soluble, N. F.) in which the oil of bitter almond has previously been dissolved. Finally add enough tar water, if necessary, to make the product measure 1 gallon.

Mica in Sheets.

(H. H.) wants some substance he can mix with powdered mica to make the latter into sheets. He says shellac is objectionable in that it crystallizes in 4 or 5 days. There are one or two processes for making powdered mica into sheets, the spreading of the adhesive substance (a trade secret) used for the purpose, being done by machinery which is covered by U. S. patent. From the description it is probable that an insoluble cement or glue is used. A cement of this character is given by the Scientific American Cyclopedia of Receipts as follows:

Clear gelatine is softened by soaking it in water; squeeze out the excess of water, then heat the gelatine until it begins to melt. Add just enough hot proof spirits stirred in to make 1 fluid ounce. To each pint of the solution add ¼ ounce gum ammoniac and 1⅓ ounces gum mastic, previously dissolved in 4 ounces rectified spirit. Liquefy by heat when wanted for use. Some experimenting is necessary as to the best method of application. Perhaps some reader can furnish practical information upon this subject.

Tooth Wash Containing Boric Acid.

(B. C. F.) The following is from the Era Formulary:

(1) Menthol	2 scruples
Oil of cloves	1½ drams
Oil peppermint	1½ drams
Boric acid	9 drams
Tincture myrrh	4½ ounces
Tincture cudbear, N. F.	2 ounces
Alcohol, to make	36 fl. ounces

Dissolve the menthol and boric acid in 20 ounces of the alcohol, add the oil and then the tinctures, filter and add alcohol to make 36 fluid ounces.

Here are two formulas containing borax and tincture of myrrh:

(2) Simple syrup	1 ounce
Glycerine of borax, B. P.	1 ounce
Tincture of rhatany	1 ounce
Tincture of myrrh	4 ounces
Eau de cologne	3 ounces
Distilled water	8 ounces
Rectified spirit	1 pint

The syrup and glycerine of borax are mixed with the water, and to this the spirit added, and finally the two tinctures.

(3) Simple syrup	1 ounce
Glycerine of borax	1 ounce
Tincture of krameria	2 ounces
Tincture of myrrh	4 ounces
Eau de cologne	3 ounces
Proof spirit	36 ounces

Mix the tincture of myrrh with the spirit before adding the other ingredients.

Bismuth Subgallate.

(O. D.) The National Dispensatory gives the following process: Bismuth subgallate is prepared by dissolving 15 parts of bismuth subnitrate in 30 parts of glacial acetic acid, adding 200 to 250 parts of water, and filtering. To the filtrate add, with constant stirring a warm solution of 5 parts of gallic acid in 200 or 250 parts of water. The precipitate is allowed to settle and washed until washings show no acidity. An impalpable, saffron yellow, odorless powder, permanent in the air and insoluble in all ordinary solvents.

Commenting upon this process, Prof. F. T. Green says (see July 15, 1894, Era, page 55):

Upon experiment I found it difficult, if not impossible, to dissolve the subnitrate of bismuth in the glacial acetic acid used. I then substituted the normal bismuth nitrate and found it to work all right. The ordinary subnitrate of bismuth was treated with nitric acid and evaporated down to very small bulk; a clear solution is the result. Add acetic acid glacial, and then dilute with water. To this clear liquid add a warm solution of gallic acid in excess. A yellow powder of bismuth subgallate falls to the bottom. Expressed by the reaction:

$$Bi(NO_3)_3 + HC_7H_5O_5H_2O + H_2O = C_6H_2(OH)_3COOBi(OH)_2 + 3HNO_3.$$

The supernatant liquid is decanted, the precipitate is repeatedly washed with warm water until washings do not react acid. Drain, and put the moist precipitate in small drops or patches on white blotting paper, and dry in air or bath below 100° C.

Here is the formula he proposes:

Normal bismuth nitrate	1 ounce av.
Glacial acetic acid	2 fl. oz. or q. s.
Gallic acid	250 grains

Dissolve normal bismuth nitrate in the glacial acetic acid; add a pint of water. Bismuth salts should not precipitate; if so, add more glacial acetic acid till clear. Filter off impurities. Dissolve the gallic acid in a pint of warm water; mix the solutions; allow precipitate to subside; decant; wash by decantation with warm water until washings no longer react acid. Dry at 100° C.; rub to powder.

For an outline of Sieker's process, see this journal, July 23, 1896, page 111.

Dispensing Hot Soda.

(E. P. H., Winnipeg, Manitoba), writes: "I'm arranging to put a hot soda apparatus into my store this fall. This will be the first of the kind introduced into Manitoba, and neither myself nor any of my employés have had any experience with these apparatuses. We are therefore at a loss to know what flavors would give the best results and how we should prepare them. The great distance from shipping centers will probably make it necessary for us to prepare our syrups, etc. We desire a few practical formulas and some pointers."

The Era has within the past few years published a great deal of information upon the conduct of the soda fountain as an adjunct of the retail drug business, and many of the suggestions made in its columns regarding this trade apply with equal force to both "hot" and "cold" soda. We suggest our correspondent consult his files of the Era, and learn what many successful dispensers have had to say about this subject.

"Hot" soda, as usually dispensed, differs from "cold" in that the former is usually made from hot, plain (uncharged) water, while the latter is made from cold, carbonated water. The hot water may be obtained by having a hot water pipe leading through the draft arm of the cold soda apparatus, but this is unsatisfactory, and the usual and better method is to have a regular heating apparatus with a boiler attachment connected with the water pipe. Manufacturers furnish these apparatuses in a variety of styles, many of them highly ornamental, as well as very practical and convenient. If you have not already selected your apparatus we suggest you correspond with the various manufacturers whose advertisements appear in this journal. You can probably get more up-to-date information in this way than in any other.

Regarding flavors, the line acceptably served for hot soda is quite small, the following embracing the usual ones: Coffee, chocolate, egg drinks, lemon, beef tea, clam juice, oyster juice, celery, etc. Fruit syrups, acid drinks and vanilla are not usually employed with hot water. As a rule the syrups must be of stronger flavor than those intended for cold soda, and must also be less sweet. Sometimes the flavors are served in the form of extracts which are introduced into the cup or mug, hot water then put in, and lastly sugar as the customer may desire. The sugar used should be cut loaf, served in fancy bowls with silver tongs. It is sometimes recommended to keep the hot soda flavors warm by placing them on the apparatus. This is not advisable because the preparations are then more liable to ferment or mold. It is preferable to keep them where they will be simply at ordinary temperature.

A selection of formulas is given on page 474, this issue.

SANITARY BARBERING.—Paris barbers and hairdressers are now obliged by the police to take sanitary measures in carrying on their business. Elaborate regulations have been sent out requiring them to use only nickel-plated combs, to substitute pulverizers for powder puffs, to cover the hair cut off with sawdust and have it removed at once, wash their hands before working on a customer, and to place all metallic instruments, razors, combs, cutting machines, etc., in a solution of soap and boiling water for ten minutes before they are used.—Sc. Am.

If you do not find what you want in the new "Classified Index of Goods," write to the Business Manager of this paper.

The Era Course in Pharmacy

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THE ERA COURSE IN PHARMACY is a thorough, practical and economical course of home study in pharmacy, and covers the subjects usually embraced in the curriculum in a standard college of pharmacy. It is designed for all who desire systematic instruction in pharmacy; for clerks who cannot attend college; for those preparing for pharmacy board examinations; as auxiliary course for students in college, and as a means of review for graduates and experienced pharmacists.

THE LECTURES are published weekly in THE PHARMACEUTICAL ERA, and the **QUIZZES** and **EXAMINATIONS** are conducted by mail. A separate question blank is issued on each lecture and sent to each matriculate, his answers are duly rated by the instructors and returned to the student with corrections and notations.

THE ENTIRE COURSE covers a period of two years and **DIPLOMAS** are issued to all passing final examinations. Each year is divided into two terms. The first term of the Junior year began September 2, 1897, and will end January 27, 1898; the second term will begin February 17, 1898, and end June 30, 1898. The junior class for 1897 is now closed.

FEES. The entire expense is only $7.75 per annum and includes subscription to the ERA, tuition fees and a binder for preserving copies and lectures.

LECTURE II.

Chemical Notation and Nomenclature.

Construction and Interpretation of Equations.

Chemical substances are represented by symbols and formulas; chemical changes are represented by *Equations*. By a proper arrangement of symbols and formulas it is possible to give a complete description of a chemical reaction, both as to the character and quantities of the substances which enter into the reaction and the character and quantities of the substances produced. An equation may therefore be defined as the description of a chemical change by means of symbols.

The advantages of equations are several. The most important is that they afford a means of representing relationships that would otherwise be difficult to understand, if not incomprehensible. In this sense an equation takes the part of a picture, presenting graphically what could otherwise be reached only by a chain of deductive reasoning. A second advantage which they afford is the means of brevity. By their use it is possible to shorten to a single line what might require a page for its full description in ordinary language.

The student will find the ability to write and read equations readily of material aid to him in his future studies, and will be amply repaid for any efforts expended in acquiring such skill.

Parts of an Equation, Factors and Products.—The substances which react upon each other, or between which the reaction occurs, are known as the *Factors* of the equation, and the substances produced as the *Products*.

In order to express the relations of the factors and products to each other the arithmetic signs for plus, +, minus, —, and equality, =, are employed. The two halves of the equation are known as *members*. The factors constitute the left hand member and the products the right hand member.

Requisites of an Equation.—1. An equation should represent a possible chemical change, that is, one which may actually take place. An equation might be made to show that hydrochloric acid had dissolved gold or platinum and converted them to their chlorids, but this would not be true chemically, since these metals are not affected by hydrochloric acid. 2. An equation must correspond to the law of conservation of mass, that is, that matter has neither been created nor destroyed by the reaction. This condition is fulfilled when each member of the equation shows an equal number of the same kind of atoms. The equation

$$Zn + H_2SO_4 = ZnSO_4 + H,$$

violates this law by showing one more atom of hydrogen in the left hand member than in the right. Apparently one atom has been destroyed in the reaction. The correct equation would be,

$$Zn + H_2SO_4 = ZnSO_4 + H_2.$$

When each member of the equation shows an equal number of the same kind of atoms, the equation is said to be "balanced."

TO CONSTRUCT EQUATIONS.

1. Write the factors, separated by the proper sign, and on the opposite side of the sign of equality, write the products. (Be sure that each factor and product has its appropriate symbol or formula. If in doubt, consult the preceding lectures.)

2. When the correct factors and products have been written, make the equation balance by adding, if necessary, to either or to both members such coefficients or subscripts as may be required to make each member show an equal number of the same kind of atoms.

Examples.

1. Represent the reaction of sulfuric acid on iron.

The products will be ferrous sulfate and hydrogen. Before balancing, the equation will stand—

$$Fe + H_2SO_4 = FeSO_4 + H.$$

By inspection it is discovered that the right hand member shows one less atom of hydrogen that the left, while all the other atoms balance. By adding the subscript 2 to the H, the equation balances—

$$^{*}Fe + H_2SO_4 = FeSO_4 + H_2.$$

2. Represent the reaction of sulfuric acid on sodium chlorid.

The products will be hydrochloric acid, and sodium sulfate—

$$NaCl + H_2SO_4 = Na_2SO_4 + HCl.$$

The first member shows a deficiency of one atom of sodium, and an excess of one atom of hydrogen. Placing

---

*In this equation the acid is represented as acting on a single iron atom. Theoretically, most elementary molecules contain two atoms, and the equation if written strictly according to theory would be—

$$Fe_2 + 2H_2SO_4 = 2FeSO_4 + 2H_2.$$

The common practice, however, is to write such equations as if separate atoms were possible.

the coefficient 2 before the NaCl gives two atoms of sodium, and two of chlorin, the latter is then sufficient to unite with both hydrogen atoms and make 2HCl. Adding these coefficients, the completed equation will stand—

$$2NaCl + H_2SO_4 = Na_2SO_4 + 2HCl.$$

3. Represent the reaction of ferric chlorid with potassium hydrate. The products will be ferric hydrate and potassium sulfate.

$$Fe_2Cl_6 + 6KOH = Fe_2(OH)_6 + 6KCl.$$

By inspection it is noted that six hydroxyls will be needed to form $Fe_2(OH)_6$, and that 6K will be required to use all the Cl atoms. Placing the coefficient 6 before KOH and KCl, the completed equation becomes—

$$Fe_2Cl_6 + 6KOH = Fe_2(OH)_6 + 6KCl.$$

4. Represent the reaction between ferric chlorid and potassium ferrocyanid.

The products will be ferric ferrocyanid and potassium chlorid.

$$Fe_2Cl_6 + K_4FeCy_6 = Fe_4(FeCy_6)_3 + KCl.$$

By inspecting the principal product, $Fe_4(FeCy_6)_3$, it is observed that there are required 4 iron atoms and 3 $FeCy_6$ radicals. To obtain these there must be taken 2 molecules of the first factor and 3 molecules of the second. These numbers yield 12 atoms of chlorin and 12 of potassium, which will combine to form 12KCl. The balanced equation will be—

$$2Fe_2Cl_6 + 3K_4FeCy_6 = Fe_4(FeCy_6)_3 + 12KCl.$$

5. Represent the reaction of sulfuric acid on ferrous sulfid.

The products will be hydrogen sulfid and ferrous sulfate.

$$FeS + H_2SO_4 = FeSO_4 + H_2S.$$

By inspection it is discovered that as the equation stands it already shows an equal number of each kind of atoms in each member, and therefore does not need the addition of coefficients or subscripts.

Predictions of Reactions.—There is no present known law which will enable us to predict with certainty the reaction which will follow the bringing together of different substances. All that is known concerning chemistry has been learned by experiment. Equations afford a means of representing what experiments teach, but only to a limited extent, if at all, do they enable us to predict possible combinations. Just as it is possible to make false statements in ordinary language, so is it possible to write thousands of equations showing reactions which cannot occur. In fact, there is scarcely any doubt but that many of the equations commonly used by chemists fail entirely to give a true account of the changes which they are designed to represent. But with all their limitations, equations are nevertheless of immense advantage in the practical applications of chemistry, and their use will enable the student to discover many new and interesting relations between atoms and their combinations which but for their aid might be overlooked.

Action of Acids on Metals.—The most usual action of an acid on a metal is to dissolve it, the metal taking the place of the basic hydrogen, while the latter escapes in the free state. The exceptions to this rule are that such metals as gold and platinum are not affected by the common acids, and that nitric acid when it dissolves a metal commonly gives off nitric oxid, NO, instead of hydrogen.

By-Products.—This is a term used to designate such products of a chemical reaction as are produced incidentally to the principal substance sought. The term is altogether a relative one. What is a by-product at one time may at another be the principal product. If, in the first equation below, the hydrogen be the substance desired, then the zinc sulfate becomes the by-product, or if the latter be the object sought, then the hydrogen would be the by-product.

Examples For Practice.

Balance the equations given below, and name the factors and products involved. Where possible, it is perhaps better to represent free elements as combined into molecules rather than as separate atoms, i. e., that $3H_2$ is a better expression for six atoms of hydrogen than 6H would be.

$Zn + H_2SO_4 = ZnSO_4 + H.$
$Zn + HCl = ZnCl_2 + H.$
$Al + H_2SO_4 = Al_2(SO_4)_3 + H.$
$Li + H_3PO_4 = Li_3PO_4 + H.$
$Mg + H_2SO_4 = MgSO_4 + H.$
$Fe + HCl = FeCl_2 + H.$
$Zn + HBr = ZnBr_2 + H.$
$Fe + HBr = FeBr_2 + H.$
$Fe + HI = FeI_2 + H.$
$Pb + H_2SO_4 = PbSO_4 + H.$
$Sn + HCl = SnCl_2 + H.$
$Cu + HCl = CuCl_2 + H.$
$Cd + H_2SO_4 = CdSO_4 + H.$

Action of Acids on Oxids and Hydroxids.—The general action of an acid on a basic oxid or hydroxid is to dissolve it, forming a salt, while the displaced hydrogen of the acid combines with the released oxygen, or oxygen and hydrogen, of the base to form water as a by-product.

An acid anhydrid, as CO_2, may also act on a basic anhydrid, as CaO, to form a salt, but as there is no hydrogen or oxygen released in such cases there is no production of water as a by-product.

$LiOH + HCl = LiCl + H_2O.$
$Na_2O + HCl = NaCl + H_2O.$
$KOH + HCN = KCN + H_2O.$
$HgO + HNO_3 = Hg(NO_3)_2 + H_2O.$
$Cd(OH)_2 + H_2SO_4 = CdSO_4 + H_2O.$
$NH_4OH + HNO_3 = NH_4NO_3 + H_2O.$
$Ag_2O + H_2SO_4 = Ag_2SO_4 + H_2O.$
$Pb(OH)_2 + HNO_3 = Pb(NO_3)_2 + H_2O.$
$Sn(OH)_2 + HCl = SnCl_4 + H_2O.$
$Bi(OH)_3 + HNO_3 = Bi(NO_3)_3 + H_2O.$
$Fe_2O_3 + HCl = Fe_2Cl_6 + H_2O.$
$SrO + CO_2 = SrO_3.$
$Sr(OH)_2 + CO_2 = SrCO_3 + H_2O.$
$Fe_2O_3 + CrO_3 = Fe_2(CrO_4)_3.$
$CaO + HC_2H_3O_2 = Ca(C_2H_3O_2)_2 + H_2O.$

Law of Precipitation.—When solutions are mixed which contain substances capable of forming a solid insoluble in the liquid present, then that insoluble substance will be formed and appear as a precipitate. Such reactions are commonly called reactions of double decomposition, since they usually consist of a simple exchange of bases, the metal of one salt taking the place of the metal of the other.

In the equations given below, to be balanced by the student, the first product at the right of the sign of equality is the insoluble one, the second product remaining in solution.

$Pb(NO_3)_2 + K_2CrO_4 = PbCrO_4 + KNO_3.$
$Hg_2(NO_3) + HCl = Hg_2Cl_2 + HNO_3.$
$AgNO_3 + HCl = AgCl + HNO_3.$
$Hg_2(NO_3)_2 + HI = Hg_2I_2 + HNO_3.$
$Pb(C_2H_3O_2)_2 + H_2SO_4 = PbSO_4 + HC_2H_3O_2.$
$SbCl_3 + H_2S = Sb_2S_3 + HCl.$
$SnCl_2 + H_2S = SnS + HCl.$
$SnCl_4 + H_2S = SnS_2 + HCl.$
$As(OH)_3 + H_2S = As_2S_3 + H_2O.$
$Fe_2Cl_6 + NH_4OH = Fe_2(OH)_6 + NH_4Cl.$
$Bi(NO_3)_3 + NH_4OH = Bi(OH)_3 + NH_4NO_3.$
$Al_2(SO_4)_3 + KOH = Al_2(OH)_6 + K_2SO_4.$
$BaCl_2 + (NH_4)SO_4 = BaSO_4 + NH_4Cl.$
$MnCl_2 + (NH_4)_2S = MnS + NH_4Cl.$
$ZnSO_4 + (NH_4)_2S = ZnS + (NH_4)_2SO_4.$
$Fe_2Cl_6 + K_4FeCy_6 = Fe_4(FeCy_6)_3 + KCl.$
$CaCl_2 + (NH_4)_2C_2O_4 = CaC_2O_4 + NH_4Cl.$
$Bi(NO_3)_3 + H_2O = BiONO_3.H_2O + HNO_3.$
$Pb(C_2H_3O_2)_2 + K_2Cr_2O_7 + H_2O = PbCrO_4 +$
$KC_2H_3O_2 + HC_2H_3O_2.$
$Al_2(SO_4)_3 + (NH_4)_2S + H_2O = Al_2(OH)_6 +$
$(NH_4)_2SO_4 + H_2S.$

LECTURE NO. 12.

Pharmaceutical Physics.

The Mechanical Powers.

Machines.—A machine is any contrivance employed for the transfer or transformation of energy in the production of work.

All mechanical structures, no matter how intricate or complex their construction, can be reduced by analysis to a combination of two or more "simple machines." Of these the six more important are the Lever, Wheel and Axle, Inclined Plane, Wedge, Screw, and Pulley.

Efficiency of Machines.—The efficiency of a machine is the ratio of the work produced to the energy supplied. If machines were ideally perfect, i. e., if they could work without friction or loss of energy, their efficiencies would be 100 per cent.

No machine can be constructed to operate without loss of energy. If the waste is 10 per cent., then the efficiency is $100 - 10 = 90$ per cent. For the better comprehension of the laws applicable to them we shall assume the use of frictionless machines.

Mechanical Advantage.—By Mechanical Advantage is meant the benefit derived from the use of a machine.

Owing to the uncreatibility of energy, a perfect machine could yield only as much energy as was applied to it, while because of friction and imperfections actual machines cannot be made to yield as much. Mechanical advantage, therefore, must be something else than a gain of energy. This something else may be the utilization of energy not otherwise available, the more advantageous application of energy, or the ability to use a small force so as to overcome a large resistance.

The Law of Machines.—Assuming a machine to be frictionless and to work without loss of energy, the general law of its action would be: The force applied, multiplied by the distance through which it is applied, will be equal to the resistance overcome, multiplied by the distance through which it is overcome.

This law differently stated to suit different circumstances is applicable to all machines, whatever their form.

If f represent the force applied, s the space through which it acts, r the resistance, and s' the space through which the resistance is overcome, the law of machines may be represented by the following formula: $fs = rs'$.

This formula, however, applies only to the ideal machine where no energy is wasted. In all actual machines allowance must be made for waste. Representing this waste by w, the formula becomes: $fs = rs' + w$.

The Lever.—The Lever in its simplest form is a straight bar, supported, on a pivot about which it is free to move. The three important points on a lever are the Fulcrum, or point of support, designated by F; the point at which the force (or "power") is applied, designated by P; and the point at which the resistance (or "weight") is overcome, designated by W. The terms load and weight are commonly used to represent resistance. According to the relative positions of these three points levers are divided into three kinds or "orders." (Fig. 29.) In the first order the fulcrum is between the load and the power. In the second order the load is between the fulcrum and the power. In the third order the power is between the fulcrum and the load.

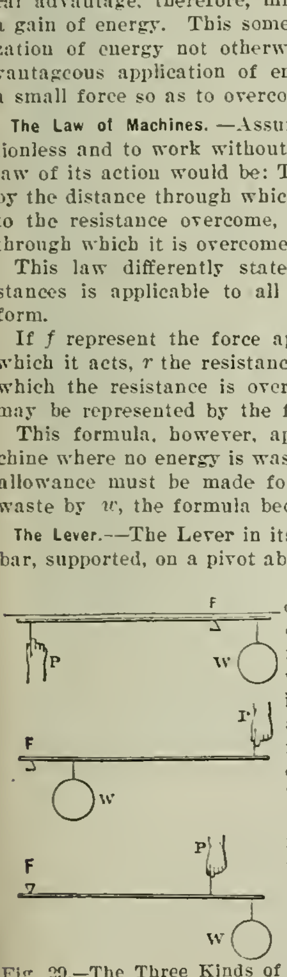


Fig. 29.—The Three Kinds of Levers.

As an aid to the recollection the student may remember that the letters, F, L, P, representing the middle points of the three kinds of levers, stand in alphabetic order.

The distance from the fulcrum of any lever to the point of application of the force is known as the force- or power-arm. The distance from the fulcrum to the point of application of the load or weight is known as the load- or weight-arm.

The ratio of the length of the power-arm to the length of the weight-arm is known as the Leverage. The greater the leverage, the larger the load which can be moved with a given force. The special law of the lever may be stated as follows: The power multiplied by its distance from the fulcrum equals the load multiplied by its distance from the fulcrum.

Mechanical Advantage of the Lever.—By increasing the length of the force-arm relatively to the load-arm, i. e., by increasing the leverage, a very small force may be made to move a very heavy weight. As compensation for this, the force must travel through a greater distance and move with greater velocity than the weight is moved. What is gained in the load is gained at the expense of velocity and distance.

If the short arm be made the force-arm, then the above advantage is reversed. The load will be moved through a greater distance and at a greater velocity, but the force applied will have to be increased correspondingly. In this case the gain in velocity and distance is compensated for by loss in force.

The Compound Lever.—If the load-arm of one lever be made to bear on the force-arm of another, the result is a Compound Lever. (Fig. 30.) This compounding may be carried to almost any extent with a corresponding increase in the load which may be lifted with a given force.

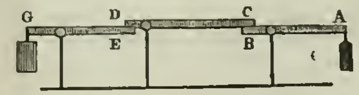


Fig. 30.—Compound Lever.

The law of the compound lever may be stated as follows: The continued product of the power-arms into the power will equal the continued product of the load-arms into the load.

In the discussion of the lever it has been supposed to be an ideal machine, without weight or friction. In actual levers these factors must be taken into account.

Pharmaceutical Applications.

The Balance.—The special application of the lever to pharmacy is in the construction of the Balance, which is commonly a lever of the first order.

In this instrument the fulcrum is the central point of support, the "weights" may be regarded as the force, and the article to be weighed as the load. In the equal arm balance (Fig. 31) the fulcrum is exactly midway between the other two points; in the unequal arm balance (Fig. 32) the fulcrum is placed nearer the load. The longer arm of the latter balance is usually provided with a movable weight known as a Poise.

In the equal arm balance the ratio of the power-arm to the load-arm, i. e., the leverage, is unity. Hence, a given weight placed in one pan will exactly balance an equal weight in the other.

In the unequal arm machine, the load which a given weight will sustain depends upon the relative lengths of the arms. A given poise on the longer arm will sustain as many times its own weight on the other arm as the distance of the poise from the fulcrum is greater than

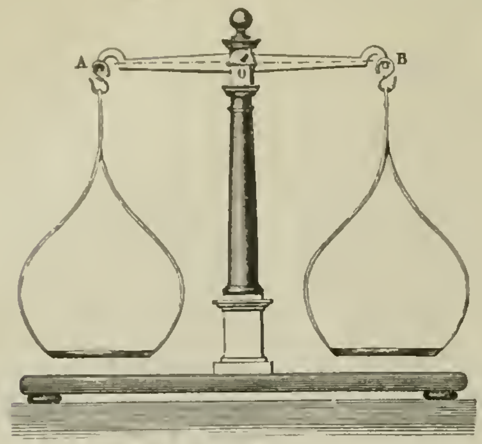


Fig. 31.—Equal Arm Balance.

the distance of the load from the fulcrum. Or, applying the law of the lever, the product of the poise into the distance from the fulcrum will equal the product of the load from the fulcrum. If the power-arm be five times longer than the load-arm, then a 2 KGm weight on the former will equal a 10 KGm load on the latter.

The Compound Lever Balance.—For the weighing of heavy goods, the simple lever balance would have to be inconveniently long, or the standard weights inconveniently large. These difficulties are avoided by the application of the compound lever to the construction of weighing machines. The most common example is the familiar "Platform Scales" of the warehouse. In this balance the article to be weighed is placed upon a platform supported by four equal levers of the second order, which in turn rest upon a single lever of the second order, and this one by means of a vertical rod, acts as the load for a lever of the first order. The last is the only one of the series which is in sight, and is counter-balanced by a movable poise on the longer arm. (Fig. 33.)

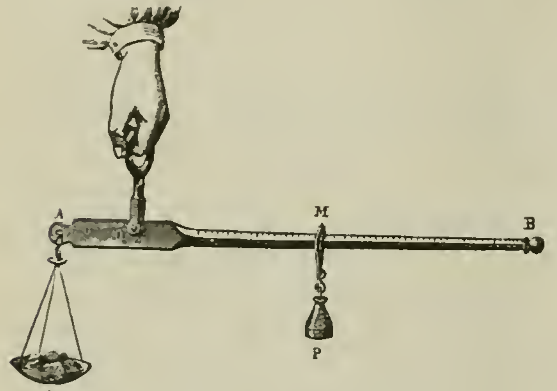


Fig. 32.—Unequal Arm Balance.

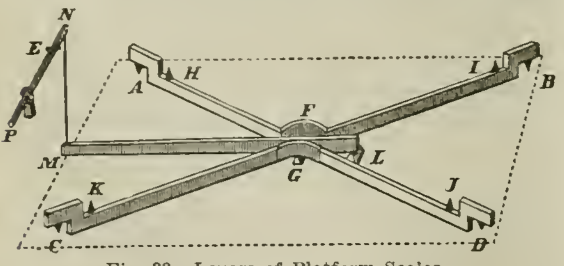


Fig. 33.—Levers of Platform Scales.

Small machines of this pattern are sometimes used on the counter, while very large ones are used for the weighing of wagons, railroad cars, etc.

Wheel and Axle.—As may be observed from the figure, the wheel and axle is a continuous form of lever. (Fig. 34.) If a hoop be fastened over the two ends of a lever of this order, the result is a wheel; or if from a wheel there are taken away the rim and all the spokes but two on opposite sides, there will be left a lever.

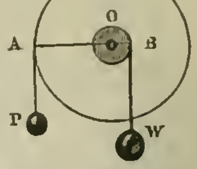


Fig. 34.—Wheel and Axle.

In the wheel and axle, the distance from the rim to the pivot upon which it turns is the force-arm, and from the surface of the axle to the pivot, the load-arm. In practice the wheel is often replaced by a crank.

Since the wheel and axle is a form of lever, the same law will apply, expressed as follows: The product of the force by the radius of the wheel will be equal to the product of the load by the radius of the axle.

As in the lever, what is gained in power is lost in speed. The distance through which the rim of the wheel passes must be as much greater than that through which the circumference of the axle passes, as the load is greater than the force.

The Train of Wheels.—Like the lever, the wheel and axle may also be compounded, forming the Train of Wheels. (Fig. 35.) In this, as shown by the figure, the peripheries are set with cogs, the teeth on the axle of one engaging with the teeth on the next wheel, and so on. The result is that the mechanical advantage of one is transmitted to the next.

In the train of wheels, the force multiplied by the continuous product of the radii of the wheels is equal to the load multiplied by the continuous product of the radii of the axles.

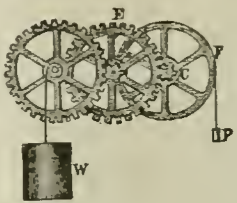


Fig. 35.—Train of Wheels.

Pharmaceutical Application.

The Drug Mill.—Probably the most useful application of the wheel and axle to pharmacy is in the construction of the common drug mill.

While the particular pattern may vary greatly, the principle of the machine is that of a large wheel (or crank) attached directly, or by a train of gear wheels with a grinding surface on the axle. The force applied to the circumference of the wheel or to the handle of the crank is the power, and the resistance of the drug is the load. Neglecting friction, the product of the power by the radius of the wheel will be equal to the product of the resistance by the radius of the grinding surface.

Inclined Plane and Wedge.—The Inclined Plane is sufficiently defined by the name —a "plane" or level surface, "inclined," or placed at an angle to the horizontal. (Fig. 36.)

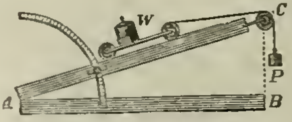


Fig. 36.—Inclined Plane.

The advantage of the plane is seen in the attempt to lift a barrel into a wagon or out of a cellar. The direct lift may be quite beyond the power of the operator, but by rolling it up the slant an exchange of distance for power is effected.

The *gradient* is the ratio of the vertical rise to the length of the plane.

On an inclined plane, a force parallel with the surface will support a load as many times greater than itself, as the length of the plane is greater than its height, or the power equals the load multiplied by the gradient. The result is best shown by an example.

If a plank three meters in length extend from the ground to a wagon one meter high, what power, neglecting friction, will be required to balance upon it a barrel weighing 150 KGm? The gradient is 3 : 9 = ⅓. The load is 150 KGm. Multiplying the load by the gradient, $150 \times \frac{1}{3} = 50$ KGm, the power necessary to sustain the barrel.

Fig. 37.—Wedge.

The Wedge is a movable inclined plane which is forced against or under the load instead of being moved over it. (Fig. 37.)

The wedge may be either single or double, and is operated by percussion.

Pharmaceutical Application.

The wedge is capable of some pharmaceutical use as a means of expression in the so-called "wedge press." In this the substance to be expressed, contained in suitable cloth, is placed between smooth surfaces which are forced together by driving in wedges with mauls.

The Screw.—The Screw is an inclined plane turned around a cylinder and has the same relation to the inclined plane just described that a spiral staircase does to a straight one. Except in the taper screws of the carpenter, a nut is used through which the screw works. (Fig. 38.)

The Pitch of a screw is the vertical distance between the centers of two contiguous threads, or it is the vertical distance through which the screw passes in making one complete revolution. If the pitch is 1-20, it means that there are 20 threads to the inch, or that the screw makes 20 complete turns in passing through a space of one inch. It will be seen, therefore, that pitch is another name for gradient.

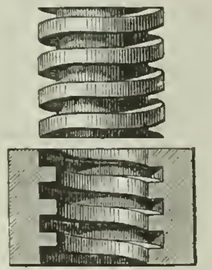


Fig. 38.—Screw and Nut.

As a screw is a form of an inclined plane the same law applies to both, or the power equals the load multiplied by the pitch.

The screw is usually turned by means of a lever attached to the upper end. When the lever is added the combination becomes a compound machine. In consequence of the great distance through which the force applied to the handle must pass as compared with the space through which the screw advances, this machine is a means by which immense power can be exerted, though only for a short distance.

Pharmaceutical Application.

The most common application of the screw to pharmaceutical purposes is in the construction of the various styles of screw "Tincture Presses."

If the screw has a pitch of 0.5 cM, and the lever a length of 0.5 M, what will be the gain in power of a force applied to the lever?

In one complete turn the end of the lever would pass through $0.5 \times 3.14 = 1.57$ M, while the end of the screw would advance only 0.005 M. The force would, therefore, advance through a space 314 times as great as the load, and would consequently be multiplied by 314, or a force of 10 KGm at the lever would produce, neglecting friction, a thrust of 3140.0 KGm at the point of the screw.

The Pulley.—The Pulley is a wheel, grooved to carry a rope, and turning on an axis. (Fig. 39.) With a single fixed pulley, the force travels as far as the load is lifted, and there is, therefore, no gain in power, the only advantage being in the change of direction of the application of a force.

By means of a movable pulley there may be a gain in power as well as the advantage of a change of direction. If the pulley to which the load is attached be movable, then for each cM the load rises the rope must travel 2cM, and according to the general law of machines the power must be doubled. If another pulley be introduced, so as to give three lines of rope acting on the load, then for each cM the load ascends the rope must move 3 cM, and the power is increased three times. (Fig. 40.) In general, the increase in power will be proportional to the number of lines of rope between the fixed pulley and the movable pulley supporting the load, while the distance passed over by the load will be in inverse proportion.

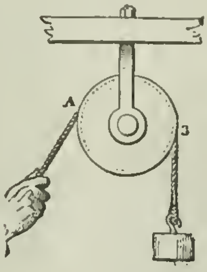


Fig. 39.—Fixed Pulley.

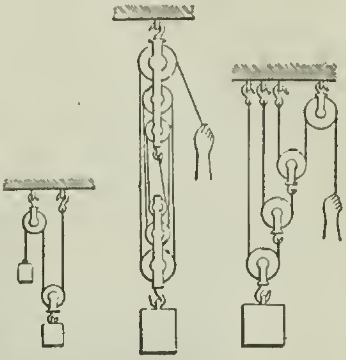


Fig. 40.—Combinations of Fixed and Movable Pulleys.

When several pulleys are fastened together in one framework, the combination is known as a block, and the individual pulleys as sheaves.

Practical Studies.

1. Measure the distance from the fulcrum of an unequal arm balance to the supports which hold the pans. Remove the poise and ascertain its exact weight. Replace the poise, place any article in the scale pan, and move the poise until it balances. Multiply the weight shown by the distance of the pan supports from the fulcrum, also the weight of the poise by its distance from the fulcrum. Are the two products equal? Why?
2. Turn a platform balance on its side, and examine the mechanism as it appears on the bottom. Trace out the connection and office of the various levers.
3. Take apart a drug mill, and trace its connection with the wheel and axle.
4. Trace the connection between the inclined plane and screw in the following manner: Cut a strip of paper into the shape of a right-angled triangle, so that its longest side represents an inclined plane. Beginning at the base, wrap the paper around a lead pencil, so that its upper edge forms a spiral, when its relation to the inclined plane becomes apparent.

An Incorrect Correction.

In the second correction given on page 456 of the Era of Sept. 30, instead of .975 M. read 9.75 M.

TO ERA COURSE STUDENTS.

Do not fail to give address and matriculation number every time you write.

Whenever possible recitation blanks will be sent some time in advance of the lectures, so as to give students the benefit of having them in hand when the lectures are received.

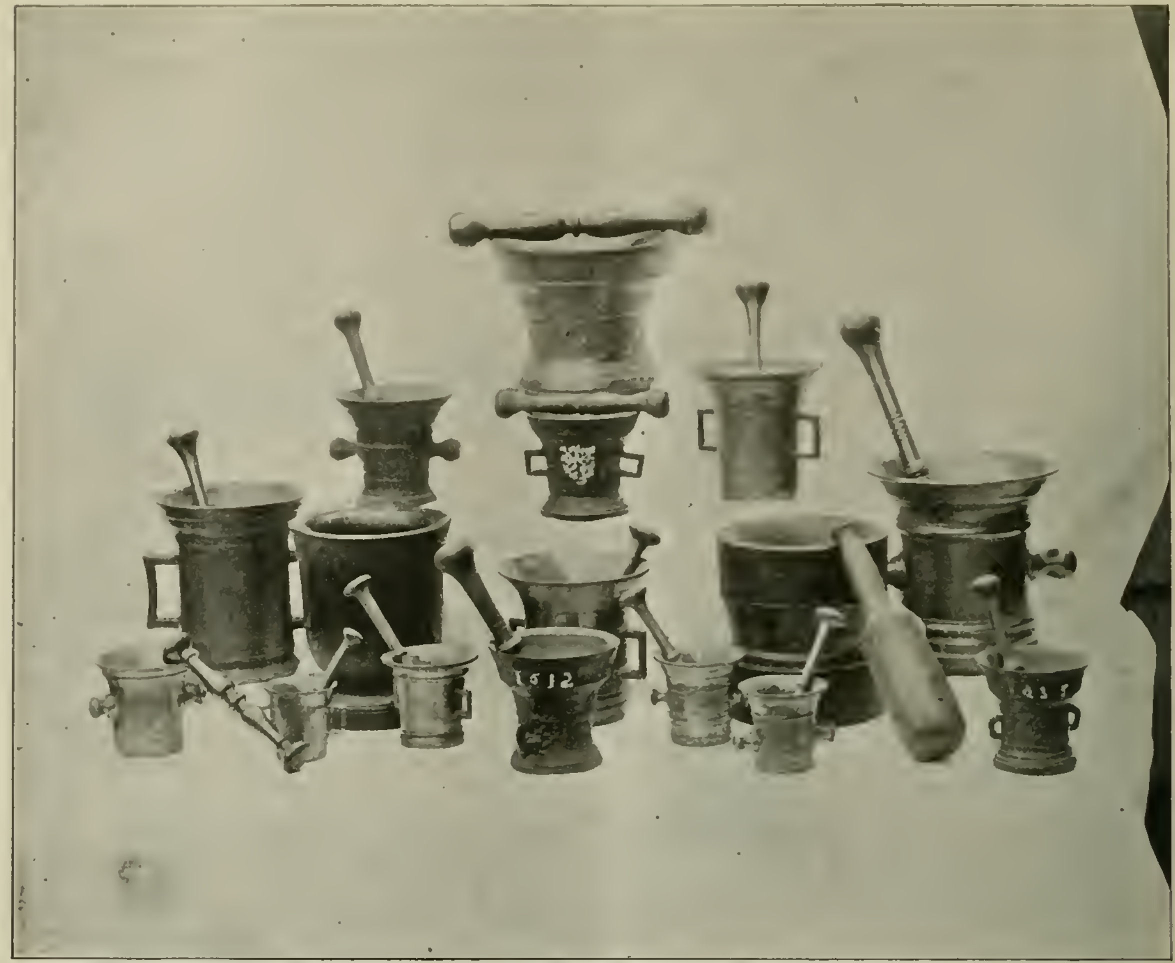
In returning recitations, the answers to at least two lectures should be sent in at once.

Make your answers brief and explicit. The better the lesson is understood the fewer words will be required to explain it.

Do not ask questions about points not considered in the lectures. Most of the explanations asked for thus far upon matters which will be treated of later.

Questions requiring a special reply should always be accompanied by return postage.

Make a special inquiry at the post office before complaining about non-receipt of quizzes, etc. A number of letters from the director's office have been returned by post masters marked "unclaimed."



A DRUGGIST'S ANCIENT CURIOS.

Just north of the Harlem River, where the approach for the driveway of the new Third avenue bridge begins its gradual ascent, stands a plain little drug store with the name of Horatio A. Tiemann over the door. Nine persons out of ten would pass this store without notice, unless they were in need of medicine, but the tenth would be attracted by some quaint and curious implements displayed in one of the show windows. For instance, there is a brass mortar which must be ten inches tall, and is beautifully molded and carved. In front of this is a small mortar of rich, dark bronze, battered and dusty with age, which bears the date 1612. Mr. Tiemann thinks that this is the oldest mortar in this country bearing a date.

On going inside the store many other objects of curiosity are to be seen. Mr. Tiemann has always had a fondness for the collection of such things, and his wife has made a business of it, having a store on Fourth avenue, where curios and old furniture are for sale. Some of Mr. Tiemann's collection he received from his father, who also had a taste for such things, but most of his relics were picked up by his wife in the course of her business. Everything of a pharmaceutical character which goes into her store is turned over to him.

Of course Mr. Tiemann values most highly his oldest mortar and pestle, although it is not nearly so prepossessing as many others cast a few years later. It is about seven inches tall, with a pair of stubby handles located very low down at the sides. It seems to have been a product of Dutch genius, although the motto is in Latin, and is an improvement on the well-known "Labor omnia vincit," (labor conquers all things). The motto around the top of this mortar reads 'Amor omnia vincit" (love conquers all things). However, to the druggist who enjoys his profession the two mottoes are synonymous. This treasure Mr. Tiemann picked up a good many years ago, and he would hate to part with it at any price.

It is never safe to admit anybody's claim to possessing the oldest mortar, for the chief charm of collecting antiquities is the ever-present possibility of discovering another specimen indisputably older. For instance, the Wissems mortar, described in the Era of Aug. 19, bearing the date 1668, is antedated by a mortar belonging to Professor Joseph P. Remington, of the Philadelphia College of Pharmacy, made by Henryck Ter Horst in 1638. Mr. Tiemann's mortar with its tribute to love antedates the Remington mortar twenty-six years. Mr. Tiemann's oldest mortar is young, however, compared with one in England, which is in the office of Corbyn, Stacey & Co., London, and bears the inscription in Old Dutch, "I Was Cast in the Year of Our Lord 1536." Probably some other Englishman has a mortar with an older date than this. Mr. Tiemann also has a Ter Horst mortar which he values very highly. The inscription reads "Henrick Ter Horst me fecit anno 1664." This was picked up in a drug store in Dorp, Holland, after which the Staten Island suburb, New Dorp, was named. It is a handsome piece of work, being ornamented around the middle with a band representing birds and vines. It is about seven and one-half inches tall, twelve inches across the top, narrowing toward the base, like an inverted bell. It has a tone like a fire engine gong and would make an excellent burglar alarm with an athletic clerk to handle the pestle.

A mortar which antedates Prof. Remington's oldest by five years is in this collection; it is about six inches tall, and of very dark bronze. It came from Germany, having been found there by a regular collector of antiquities. The motto around the top reads "Iohan Bush-Man Ao. 1633."

One of the most curious mortars in the collection, as showing the loyalty of the maker to his better half, was found in Amsterdam by the same collector. It reads "Wigbelt Engelbert unde sin hus Frou." Mr. Tiemann says that this means "Wigbelt Engelbert and his wife."

These very old mortars are not handsome, except in the eyes of the antiquarian. They are angular, squat, and all have queer little handles, generally located very near the base. The Engelbert mortar is the most pretentious in decoration, having a coat-of-arms, which it might be interesting for Knickerbocker druggists of the true Dutch blood to investigate. The really beautiful mortars date from the beginning of the 18th century, and look as though they had been turned on a lathe, so symmetrical are the moldings upon them. They are generally mounted with a knob at either side, by which they were suspended upon gimbals. These are not generally ornamented with figures, and bear no date or inscription. A very substantial mortar of this class stands in the show window. It is about ten inches tall and weighs about sixty pounds. It has a pestle, also prettily molded, with a great knob at either end, which would delight the heart of a South Sea Islander for use as a club. There is another old mortar in the cellar somewhat like this but not so graceful, which weighs considerably over one hundred pounds. Mr. Tiemann says the latter was of English make. In contrast with these is a tiny brass mortar, highly polished, which only dates from the beginning of the present century. Another one of these brass mortars is all covered with carvings; it is slender and very tall.

Two of the oddest looking mortars are made of lignum vitæ. They are of English manufacture, and are perfectly plain. They stand in the show window.

The illustration shows the 1612 mortar in the center of the foreground. At the extreme right is the 1633 mortar, and at the left a curiously carved brass mortar with an elaborately turned pestle over a hundred years old. At the apex in the rear is the gem of the collection from an artistic point of view, the Ter Horst mortar with its beautiful carvings. On either side of it is a tall, slender brass mortar and in front of these the wooden mortars with their potato masher pestles. The Engelbert mortar with its coat-of-arms is in the center of the group slightly elevated. An attempt was made to bring out the coat-of-arms and the dates on one or two of the mortars by touching up the raised surfaces with a piece of magnesia, but the result is not entirely satisfactory. There seems to be no doubt about the genuineness of the collection, which, after all, must be seen to be appreciated.

Mr. Tiemann makes no great matter of his treasures, and few people in the city know about them, except his personal friends. He has not confined himself to a collection of mortars. In the show case there is a miniature skull carved in ivory, which is wonderfully perfect; every bone in the human head is outlined upon it. Mr. Tiemann bought it from a South American, stranded in this city, who had inherited it from his father. The story is that it was carved by a monk, who had been imprisoned during some sort of revolutionary disturbance, and that it secured for him his freedom. Mr. Tiemann has refused $25 for it. In the private office back of the prescription counter there is an old engraving representing Jenner, his son and a group of old school physicians, who are certainly very much vexed at the success of vaccination, judging by the expression upon their faces. Side by side there are pictures of Luther presenting a protest at the Diet of Spires, and of Tom Paine, the great freethinker of the last century. There is also a specimen of the first French lithographic art in half a dozen colors. The furniture is old. For instance, there is a beautiful Chippendale arm chair of revolutionary times. Behind the closed doors of the old-fashioned bookcase there are many ancient medical works in both English and German. These are only a few of Mr. Tiemann's treasures which are peculiarly interesting to pharmacists. Such things as an arm chair which once belonged to Abraham Lincoln, and a cup and saucer, now the property of Mrs. Tiemann, which were originally given by Queen Victoria to an English lady, show the value of Mr. and Mrs. Tiemann's possessions in other fields than those of pharmacy.

THE CAMPHOR TREE.*

(Cinnamomum camphora Nees & Eberm.)

Description.

The camphor tree is a broad-leaved evergreen, related to the red bay and to the sassafras of the United States. In its native habitat it attains a height of 60 to 100 feet, with wide-spreading branches and a trunk 20 to 40 inches in diameter. Its general habit is similar to that of the basswood. The leaves are broadly lanceolate in form, with acuminate points at both base and apex, of a light green color, smooth and shining above and whitish, or glaucous, on the under surface. The lower pair of lateral veins are more prominent than the others, but the leaves are not as distinctly 3-nerved as those of the cinnamon and many other species of the genus. The small white or greenish-white flowers (Fig. 1, b) are borne in axillary racemes from February to April on shoots of the previous season, and are followed in October by berry-like, one-seeded fruits about three-eighths of an inch in diameter (Fig. 1, c). The fruiting pedicels terminate in a saucer-shaped disk, persisting after the mature fruit has fallen.

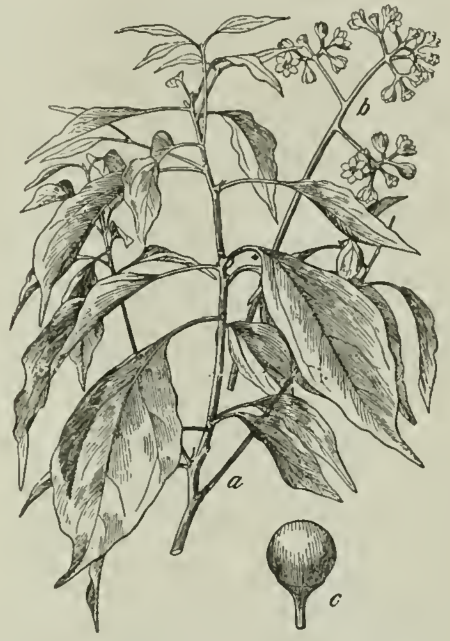


Fig. 1.—Camphor tree; a, young leafy shoot, scale one-third; b, flower cluster, life size; c, fruit, life size.

Native Range.

The camphor tree is native in the coast countries of Eastern Asia from Cochin China nearly to the mouth of the Yang-tse-kiang and on the adjacent islands from the southern part of the Japanese Empire, including Formosa and the Ryukyu Islands, to Hainan, off the coast of Cochin China. Its range also extends into the interior of China as far as the province of Hupeh, about 500 miles from the coast on the Yang-tse-kiang, in latitude 30° north. This area, extending from 10° to 34° north latitude and from 105° to 130° east longitude, is all embraced in the eastern monsoon region, which is remarkable for abundant rains in summer.

The camphor trees growing wild in the native range are usually most abundant on hillsides and in mountain valleys where there is good atmospheric as well as soil drainage. The temperature in the greater part of this region, which is partly within the tropics and partly subtropical, rarely falls below freezing. The tree is an evergreen, changing its leaves generally in April, and therefore the winter temperature is a factor of more importance than would be the case with a deciduous tree.

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*Circular No. 12, of the United States Department of Agriculture, Division of Botany.

Range Under Cultivation.

Notwithstanding the comparatively narrow limits of its natural environment, the camphor tree grows well in cultivation under widely different conditions. It has become abundantly naturalized in Madagascar. It flourishes at Buenos Ayres. It thrives in Egypt, in the Canary Islands, in Southeastern France, and in the San Joaquin Valley, in California, where the summers are hot and dry. Large trees, at least two hundred years old, are growing in the temple courts at Tokyo, where they are subject to a winter of seventy to eighty nights of frost, with an occasional minimum temperature as low as 12° to 16° F. The most northern localities in the United States, so far as known at this department, where the camphor tree has been grown successfully out of doors are Charleston and Summerville in South Carolina, Augusta, Ga., and Oakland, Cal.

At Charleston, Summerville, and Augusta the trees have withstood a minimum temperature of 15° F, but they have been protected by surrounding trees and buildings. At Mobile, Ala., the trees have grown and fruited in protected situations, while in exposed places they have been repeatedly destroyed by frosts. While the camphor tree will grow on almost any soil that is not too wet, it does best on a well-drained sandy or loamy soil, and it responds remarkably well to the application of fertilizers. Its growth is comparatively slow on sterile soils, but under favorable conditions it sometimes grows very rapidly. An instance is recorded of a camphor tree in Italy a foot in diameter and 90 feet high, eight years from the seed. Under ordinary conditions, however, such a girth is not often attained in less than twenty-five years, and such a height is rarely attained in a century. Under favorable conditions an average of 30 feet in height, with trunks 6 to 8 inches in diameter at the base, may be expected in trees ten years from the seed.

Uses of the Tree and Its Products.

The principal commercial uses of the camphor tree are for the production of camphor gum and camphor oil. Camphor gum is employed extensively in medicine. It enters into the composition of many kinds of liniments for external application. For liniment it is used especially in combination with olive oil. It is taken internally for hysteria, nervousness, nervous headaches, diarrhœa and diseases affecting the alimentary canal. It is a specific in cases of typhoid fever and cholera. Camphor fumes have been used with success in cases of asthma. It has been used very extensively to keep insects out of furs, woolens, etc. In Japan camphor and camphor oil are used in lacquer work. The oil is somewhat similar to turpentine, and could doubtless be used to advantage in varnishes and shellacs. It is now used in the manufacture of toilet soaps. In Japan and China it has been used for illuminating purposes, but it produces a smoky flame.

Among the secondary uses of the camphor tree the most important is for ornamental planting. Its bright evergreen leaves, rapid growth, and long life make it valuable for this purpose. In Japan and China it has been the principal tree planted in the temple courts for many centuries, and in those countries it takes the place of the historic oaks of England. It has been extensively introduced into Southern Europe and South America for ornamental purposes.

The wood, with its close grain, yellow color, and susceptibility to polish, taking a kind of satin-like finish, is exceedingly valuable in cabinet work, especially for making drawers, chests, and cupboards proof against insects. The leaves and young branches, although they have but a slight odor of camphor, are packed with clothing or scattered about unused rooms to guard against insects.

The tree produces an abundance of berry-like fruits, which are used in Japan and China to make a kind of tallow. The fruits are greedily eaten by chickens and birds, especially mocking birds, which often select camphor trees for nesting places.

Conditions of Successful Cultivation.

For most of the secondary purposes, the camphor tree may well be cultivated wherever it can be made to live; but for the distillation of gum and oil with a commercial view, and for the production of wood for cabinet purposes, it must be grown under the most favorable conditions. The minimum winter temperature should not be below 20° F., and this minimum should be of rare occurrence. The soil, preferably sandy, and well drained, should be irrigated unless there are abundant rains. Fifty inches of water during the warm growing season is desirable, and much more may well be used where the air is very dry.

An abundance of plant food, rich in nitrogen, is required for rapid growth, but the kind of fertilizer that can be most profitably applied will vary according to the character of the soil in each locality. In the absence of definite information in this regard the kind of fertilizer producing most rapid growth of wood in the orange or in other fruit trees may be taken as an index.

The northern boundary of the dotted area on the accompanying map (Fig. 2) marks, approximately, the limit within which the camphor tree may be grown in situations protected by buildings or by other trees, while the northern limit of the area shaded by lines marks the approximate boundary of the area within which it may be grown without protection. Further experiments in planting the camphor tree will doubtless modify both of these lines somewhat. It is hoped that by continued selection of seeds from the most hardy trees plants may be bred up to endure more cold.

Propagation.

Camphor trees may be grown either from seed or from cuttings. They are usually grown from seed, as the trees fruit abundantly, and seedlings can be grown more easily than cuttings. The seeds are collected at maturity in October and November, and after drying are packed in sharp white sand or some similar material to keep them fresh until the time of planting in spring. About the last of March they are sown in drills in the seed bed.

The seedbed soil should be a good sandy loam mixed with about one-third leaf mould. The seed bed should be kept moist, but not too wet, and should be shaded from the direct rays of the sun if the weather is warm. The best soil temperature for germinating camphor seeds is from 70° to 75° F. The temperature of the atmosphere may be ten degrees higher. The seedlings will grow well at higher temperatures, but are likely to lack vigor and hardiness.

The seedlings may be grown in pots, which will facilitate transplanting at any time, or they may be transplanted in nursery rows early in April when one year old. Plants two years old are generally regarded as best for final planting. At this age they vary from 20 to 40 inches in height.

Planting and Cultivation.

When set out for ornamental purposes, the camphor tree may be expected to grow, in favorable situations, about as rapidly as a Le Conte pear, and to require about as much room. In Japan, where the law requires that a new tree shall be set out for every one cut, they are not generally set in straight orchard rows, but cultivation there is performed almost exclusively by hand labor. There are no records showing results of regular orchard planting, hence the distances at which trees should be planted must be determined by the size and form of the trees and the methods of cultivation and of procuring the gum. They may be set closely in rows about 10 feet

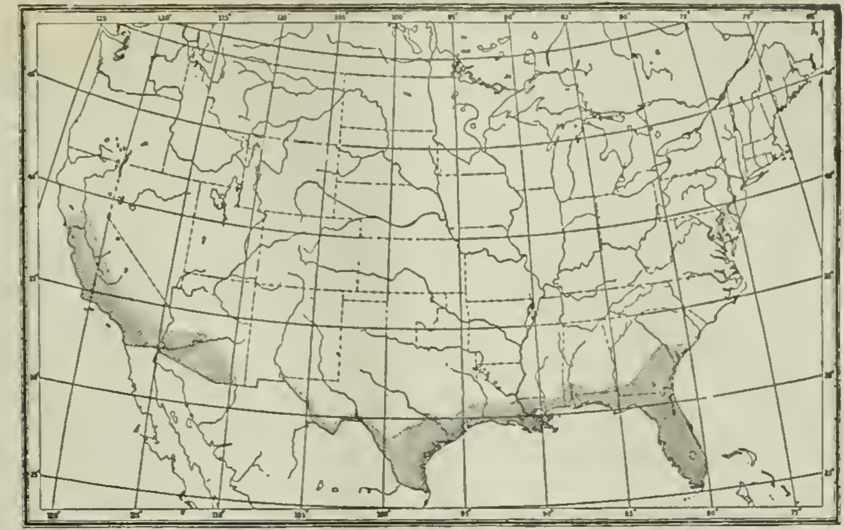

Fig. 2.—Map showing approximate areas where the camphor tree may be grown in the United States. In the dotted area protection from cold will be required. In the line-shaded areas protection will not often be required except in exposed situations, and on the mountains of California.

apart, and alternate rows cut and reset every five years, thus producing bush-like plants of ten years' growth. They may be planted in checks 10 feet square, and alternate trees cut every ten or twelve years, or they may be planted in larger checks, and all of the trees be cut at the age of fifteen or twenty years.

There are not sufficient data obtainable upon which to base definite statements as to the best methods of planting or the age at which the trees may be cut with greatest profit for the production of gum. A recent English consular report from Japan states that "although hitherto the youngest wood from which camphor was extracted was about seventy to eighty years old, it is expected that under the present scientific management the trees will give equally good results after twenty-five or thirty years." Camphor of good quality has been produced in Florida from the leaves and twigs of trees less than twenty years old, one pound of crude gum being obtained from 77 pounds of leaves and twigs.

The trees will endure severe pruning with little apparent injury. One-third of the leaves and young shoots may be removed at one time without materially checking the growth of the tree. The largest proportion of camphor is contained in the older, larger roots; the trunk, limbs, twigs, and leaves containing successively a decreasing proportion. When the camphor tree is killed nearly to the ground by frost it sends up vigorous shoots from the base. It may be expected to do the same when cut, especially if cut late in the fall. Experiments are needed to determine whether this growth may be depended upon, or whether it will be more profitable to dig out the larger roots and set out new seedlings.

Distillation of Camphor in Japan.

In the native forests in Formosa, Fukien, and Japan camphor is distilled almost exclusively from the wood of the trunks, roots, and larger branches. The work is performed by hand labor, and the methods employed seem rather crude. Different methods of distillation are employed in different districts, but those in use in the province of Tosa, in Japan, appear to be the most skillful. The camphor trees are felled and the trunk, larger limbs, and sometimes the roots, are cut into chips by hand labor with a sharp concave adz.

The fresh chips are placed in a wooden tub about 40 inches high and 20 inches in diameter at the base, tapering toward the top like an old-fashioned churn. The perforated bottom of the tub fits tightly over an iron pan of water on a furnace of masonry. The tub has a tight-fitting cover, which may be removed to put in the chips. It is surrounded by a layer of earth about 6 inches thick to aid in retaining a uniform temperature. A bamboo tube extends from near the top of the tub into the condenser. This consists of two wooden tubs of different sizes, the larger one right side up, kept about two-thirds full of water from a continuous stream which runs out of a hole in one side. The smaller one is inverted with its edges below the water, forming an airtight chamber. This air chamber is kept cool by the water falling on the top and running down over the sides. The upper part of the air chamber is sometimes filled with clean rice straw, on which the camphor crystallizes, while the oil drips down and collects on the surface of the water. In some cases the camphor gum and oil are allowed to collect together on the surface of the water and are afterward separated by filtration through rice straw or by pressure.

About twelve hours are required for distilling a tubful by this method. Then the chips are removed and dried for use in the furnace, and a new charge is put in. At the same time the camphor and oil are removed from the condenser. By this method 20 to 40 pounds of chips are required for one pound of crude camphor gum.

The principles generally held to be essential in distilling camphor of good quality are: (1) The heat must be uniform and not too great, producing a steady supply of steam; (2) the steam after liberating the camphor must not come in contact with metal, that is, the tub and condensing apparatus must be of wood.

Suggested Improvements.

Many improvements upon the methods described can doubtless be made, tending both to a reduction in cost and an increase in the proportion of crude gum obtained. Instead of an adz wielded by hand labor a machine similar to the "hog" used for grinding up waste slabs in sawmills may be used to reduce camphor limbs to the requisite fineness for distillation. Better distilling apparatus can probably be devised. Thermometers may be introduced to determine the heat in the distilling tub, and the furnace may be so arranged as to permit better control and greater economy in fuel. Camphor and camphor oil are both slightly soluble in water, and the condensing chamber should be improved so as to recover the product that is being constantly carried off in the running stream which cools the chamber.

Outlook for Future Market.

The consumption of camphor in this country, as measured by the importations, has been decreasing during the past ten years, while the price has been increasing, as indicated by the following table:

IMPORTS, VALUES AND APPROXIMATE VALUES PER POUND OF CAMPHOR FOR YEARS ENDED JUNE 30, 1887 1896, AND FOR NINE MONTHS ENDED MARCH 31, 1897.

Years.	CRUDE CAMPHOR—DUTY FREE.			REFINED CAMPHOR—DUTIABLE.			
	Quantities.	Values.	Value per Pound.	Quantities.	Values.	Value per Pound.	Rates of Duty.
	Pounds.			Pounds.			Per lb.
1887	2,873,184	$352,861.00	$0.12	307	$45.00	$0.15	5 cents.
1888	2,779,719	304,460.00	.11	61	7.77	.13	"
1889	1,974,500	293,031.44	.15	72	10.50	.15	"
1890	2,081,370	421,385.00	.20	87	37.75	.43	"
1891	1,666,074	468,025.00	.28	63	21.23	.33	4 cents.
1892	1,955,787	447,634.00	.23	56,820	17,361.00	.31	"
1893	1,723,425	446,548.00	.26	156,291	51,229.33	.33	"
1894	1,323,932	309,407.00	.23	137,882	44,231.00	.32	"
1895	1,509,713	284,958.00	.19	271,164	83,382.00	.31	(*)
1896	943,205	328,457.00	.35	153,912	68,785.00	.45	(*)
For 9 months, March 31, 1897 (latest reports obtainable).	855,284	206,137.77	.24	155,027	52,811.00	.34	(*)

* Ten per cent. ad valorem.

The tariff act approved July 27, 1897, imposes a duty of 6 cents per pound on refined camphor and leaves crude camphor on the free list, as heretofore.

There has been an increase in importations of refined camphor, due to improved methods of refining and packing in Japan and to changes in the tariff, but this increase has been much more than counterbalanced by the decrease in importations of crude camphor. The decrease may be attributed to the following causes: (1) The exhaustion of the supply of the available camphor trees near the shipping ports; (2) the governmental restrictions on the trade in camphor in Formosa; (3) government taxes on the exportation of camphor from Formosa; (4) hostilities and wanton destruction of camphor stills by the natives in Formosa; (5) disturbances in the camphor-producing district of China; (6) the China-Japan war; (7) attempts by speculators to corner the market.

These causes have increased the price of camphor, and this in turn has led to the introduction of substitutes. Menthol and other peppermint derivatives or compounds, carbolic acid and its derivatives, naphthalin, formalin, and insect powder are now used for various purposes where camphor was formerly employed. Camphor has been manufactured artificially, at a cost leaving a margin of profit at present prices. It is therefore apparent that if the production of camphor from the trees is to be carried on with profit in this country and the industry increased to any considerable extent, the price of camphor must be reduced to compete with the prices of substitutes now taking its place.

Camphor has been obtained from several other plants not at all related to the ordinary camphor tree, but only two kinds, Borneo camphor and Blumea camphor, are of any importance commercially.

Borneo camphor is obtained from the camphor tree of Borneo and Sumatra, Dryobalanops aromatica. It is deposited in clefts and hollows in the wood, and has simply to be taken out. This camphor is comparatively rare and the supply is consumed almost exclusively in China, where it is valued at from thirty to ninety times as much as ordinary camphor.

Blumea camphor is obtained by distillation from Blumea balsamifera, a shrub growing in Burmah and the Malay Peninsula. This is usually refined in Canton, whence about 10,000 pounds are exported annually. The source of this supply is abundant, and as the industry develops it is likely to enter more into competition with ordinary camphor. Neither of these plants can be grown in the United States, except possibly in southern Florida, without protection against cold.

LYSTER H. DEWEY,
Assistant in Division of Botany.

Approved:
JAMES WILSON,
Secretary of Agriculture.
Washington, D. C., Aug. 12, 1897.

MEXICO.

Of late years Mexico has been held up to us as a country of wonderful progress and commercial activity, and it is not strange that such conditions should excite the interest of citizens of the United States, who imagine that they see in them something that reflects their own methods and their spirit of enterprise. We all like to do business with the pushing, progressive fellow, and the Mexican republic is now in a position to be exceedingly attractive to us as a business proposition. They don't do business down there exactly as we do, their language and customs are things to be learned, and they don't seem to have any ex-presidents, but they do have a protective tariff which we can't help but regard as an obstacle when viewed from this side of the Rio Grande, even if the foreigner does not pay the tax.

This feature of business with Mexico was discovered some time ago by our manufacturers of proprietary medicines, pharmaceuticals, etc., and has led to the establishment by many of them of branch laboratories within Mexican territory, so that their products could be delivered to the trade of that country without the addition of customs charges levied upon manufactured goods. All manufacturers are, however, not in a position to do this, because of the expense for a plant.

This difficulty seems to be obviated by a plan put forth by a Mexican firm, Jose E. Bustillos "Hijos," Calle de Tacuba No. 778, City of Mexico, who issue an eight-page booklet giving details of their method of manufacturing secret proprietary medicines for the account of American proprietors, and putting them up in shape for the market. Two points upon which emphasis is laid is the fact that much raw medicinal material is produced in Mexico, and that the rates of wages are much lower than in Europe or the United States. The firm states that it is fully equipped with all the machinery necessary for manufacturing anything in the pharmaceutical line, and that containers and labels are available at low prices, although the import duty on these articles is not so great as to be a disadvantage to importation. The secrecy preserved by the firm with relation to formulas entrusted to it is guaranteed, but in case where the proprietor does not desire to have this disclosed, even under a guarantee of secrecy, arrangements can be made to have the manufacturing processes conducted by a representative or employé of the proprietor.

The Mexican firm takes charge of matters relating to the procurement of patents, or registration of labels, trade marks, etc., and the prosecution of imitators and counterfeiters.

HÆMOLUM ZINCATUM.—A preparation used for increasing the amount of hæmoglobin in the blood. It is given in the form of a pill in anæmia and chlorosis.

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J. H. BEAL, Sc.D., Ph.G., Director.

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LECTURE 13.

Inorganic Chemistry.

Some Materials and Manipulations.

As it is expected that these lectures will be followed principally by those who have not had the benefit of prior training in chemistry, and without the aid of a teacher, it has been thought best to preface them with a list of some of the materials which will be needed, together with a brief description of some of the more common manipulations employed in qualitative work.

While there can be no perfect substitute for the personal supervision of a teacher, or for the resources of a well equipped laboratory, it is, nevertheless, possible for an earnest student, working by himself and with a very meager equipment of apparatus and reagents, to acquire a considerable degree of skill in chemical manipulation, and to gain a large amount of valuable information concerning the reactions of the principal elements and their compounds.

The major portion of the apparatus needed in carrying out the practical studies which will be assigned will be found in the average drug store, or may be constructed of materials to be found there. When the student cannot obtain them otherwise, he is recommended to buy them.

Glass and Porcelain Ware.—The articles of glassware most commonly needed in the simple experiments employed in the study of elementary chemistry are, Test Tubes, Beakers and Flasks. These are purposely made of thin glass, and well annealed, in order to withstand the sudden changes of temperature to which they are frequently exposed.

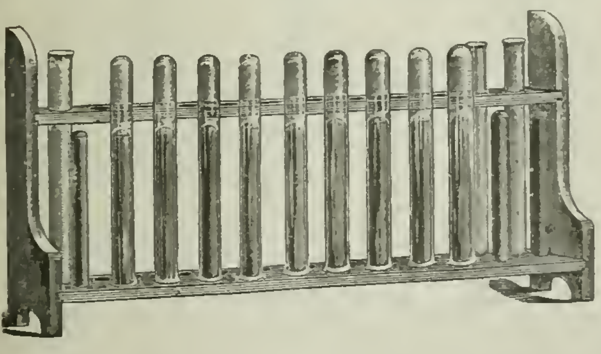
Fig. I.—Test Tubes and Rack.

The Test Tube is simply a tube of thin glass, closed at one end, and used either as a container in which solutions are mixed, or as a vessel in which they may be heated. The most convenient size for all purposes is about 12 cM long by 2 cM wide.

When the liquids are being heated in a test tube, the latter should be held between the thumb and first two fingers and gently rolled back and forth through the flame, so as to avoid its becoming overheated above the liquid, which event will probably be followed by the fracture of the tube and the loss of its contents.

To begin with the student should have about a dozen tubes of the size mentioned above, usually listed by the dealers as 5-inch tubes. (Fig. 1.)

For the convenient support of the tubes a test tube rack, shown in the figure is necessary. A better one, though not as handsome, can be made from a piece of "scantling," about 25 cM long by 10 cM in width. Along one side of this bore a row of holes, 2 cM in diameter, and along the other a row of gimlet holes. Into the latter insert a row of pegs upon which to place the tubes while draining. The larger holes are used to support the tubes in an upright position when they contain a liquid.

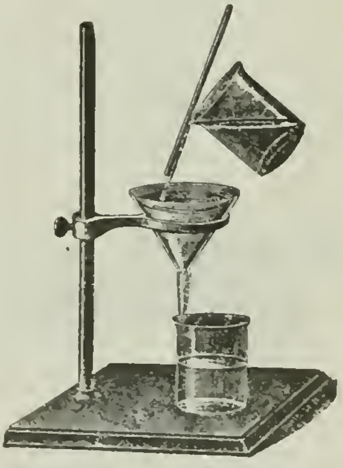
Fig. 2.—Beakers, Funnel and Ring Stand.

Beakers are thin, tumbler-shaped vessels of glass, usually with a "pour-out" at one edge. (Fig. 2.) They are intended to contain liquids while being heated or evaporated. The most useful sizes for the exercises prescribed in these lectures are 50 to 100 Cc. The number required will depend on the quality of the glass and the carefulness of the student. With care a half-dozen beakers of good quality should last throughout the entire course.

Flasks may be either of the globe-shaped pattern, or of the style known as the Erlenmeyer, or Assay Flask. (Fig. 3.) The latter is probably the better for all purposes. They are used as gas generators, as precipitating jars, or as convenient vessels for liquids which are to be boiled for some time.

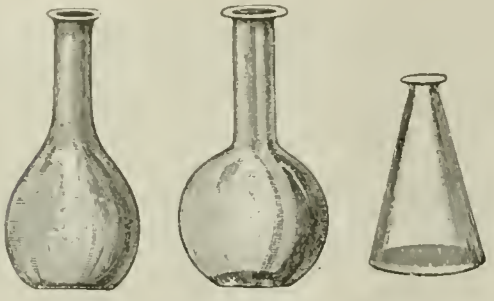
Fig. 3.—Chemical and Assay Flasks.

Porcelain Evaporating Dishes are of the same style as those employed in the larger operations of the pharmacy, but smaller. Several of these should be at hand, of a capacity of 50 to 100 Cc.

Test tubes are heated by holding them directly in the flame, but beakers, flasks and dishes should always be separated from the flame by wire gauze, asbestos paper, or a sand- or water-bath. For common operations a piece of the common brass gauze from the tinner, about 10 cM square, will answer better than any of the others.

The Ring Stand consists of an iron upright screwed into an iron base, and carrying movable rings of several sizes which can be placed at different elevations. (Fig. 2.) The rings are used as supports for the wire gauze, upon which is placed the beaker or dish which is to be heated. If a ring stand is not at hand, the student can make a very serviceable article, using stout iron wire for the rings, and a pine stick fastened into a block for the support.

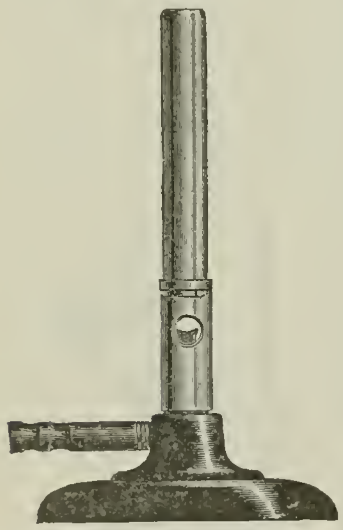
Fig. 4.—Bunsen Burner.

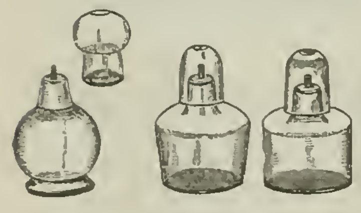
Fig. 5.—Alcohol Lamps.

Bunsen Burner and Alcohol Lamp.—As a source of heat for his chemical operations the student should be provided with either a Bunsen Burner or an Alcohol Lamp. The first is the more efficient where gas is available. It is so simple in structure as to require no comment, except to remind the inexperienced that in order to obtain the blue, smokeless flame, the brass collar at the bottom must be turned so as to uncover the holes in the sides of the burner. (Fig. 4.)

The ordinary alcohol lamp is shown in Fig. 5. For want of a better, a fairly good lamp can be improvised from a morphine vial, by closing it with a stout cork, through the center of which is run a glass tube containing an ordinary round wick.

Instead of grain alcohol the less expensive wood alcohol can be used, and is equally as efficient.

The Platinum Wire.—An article of frequent usefulness in qualitative work is a piece of platinum wire fixed into a handle of thin glass tubing. (Fig. 6.) The principal applications of the platinum wire are in the making of "Flame Tests," and "Borax Beads." For a flame test the wire, perfectly cleaned, and having a small loop made on the end, is dipped into the liquid to be tested and then held in a non-luminous flame. When treated in this manner certain metals have the property of imparting characteristic colors to the flame.

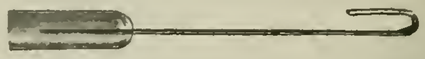
Fig. 6.—Platinum Wire and Holder.

In the borax bead test, the loop at the end of the wire is made red hot and dipped into powdered borax, which adheres in a lump. This is then heated until it runs into a perfectly clear bead, a blowpipe being used if necessary. When the bead has become clear it is dipped into the solution to be tested and again heated, with the aid of the blowpipe. Several metals when thus treated impart brilliant and very characteristic colors to the bead.

Instead of platinum wire, aluminum or iron may be used, but are usually unsatisfactory. Perhaps a better substitute is a thread of asbestos.

Operations with the Blowpipe.—The Blowpipe in its simplest form is a tapering brass tube, curved toward the taper end until the tip of the latter points at right angles to the stem. (Fig. 7.)

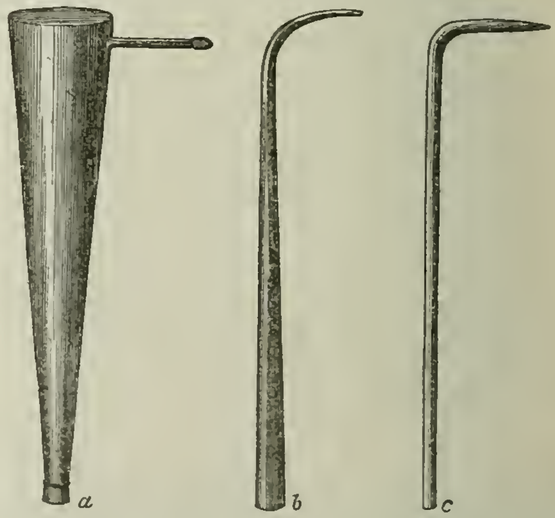

Fig. 7.—Blow Pipes.

An ordinary lamp or candle flame, or the flame of a bunsen burner, when the holes are partly closed, on examination will be seen to consist of essentially three parts or "zones." 1. A central dark zone of unburned gas. 2. A middle luminous zone of incandescent carbon particles. 3. An outer non-luminous or nearly invisible envelope. (Fig. 8.)

The luminous zone being poor in oxygen tends to take up that element from substances containing it. It is, therefore, called the reducing or deoxidizing flame. The outer envelope being rich in oxygen, tends to give up that element to other substances held within it, and is known as the oxidizing flame. The tips of the respective zones possess the greatest activity.

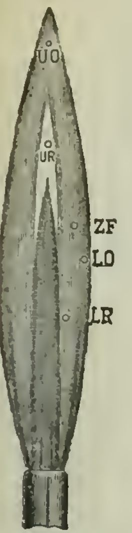

Fig. 8. Structure of Flame.

By means of the blowpipe we may either change the direction of alter the character and intensity of the flame. To produce a good reducing flame, place the end of the blowpipe just outside the flame, using a blast only strong enough to bring the tip of the luminous cone on the substance to be reduced. For oxidizing operations bring the blowpipe within the flame and use a stronger blast. The substance to be oxidized should be just within the tip of the non-luminous cone.

As a support for the substance there may be used a piece of charcoal, chalk, platinum foil, a fragment of broken evaporating dish, a flat slab of gypsum, etc. For the purpose of the beginner the charcoal will be most useful.

Having selected a piece of convenient size, a slight hollow is scraped in one end by pressing the edge of a coin against the coal and rotating. This concavity is used to contain the substance to be heated, which is technically known as the "Assay."

Among the more common reactions gained by heating on charcoal are reductions to the metallic state, the production of colored flames, vapors of different colors and odors, incrustations, etc.

Cutting and Bending of Glass Tubes.—Several feet of glass tubing of small caliber will be required for this work. To cut glass tubes, make a scratch with a file at the point where the cut is to be made, then taking it in both hands, place the thumbs together over the place to be broken, and pull *outward* and *downward*.

The end of a tube may be rounded by holding in a flame until the sharp edges are fused. By keeping in the flame long enough the end may be entirely closed.

To bend a tube, close one end with a cork, or putty, and heat for some distance on either side of the place where the bend is to be made, turning it in the flame so that it may be heated evenly. When the tube is soft enough, hold it by one end and allow the other to sink with its own weight, or bend very carefully with the hands. (Fig. 9.) If bent too rapidly the tubs will be flattened at the curve. (Fig. 10.) In that case, heat the flattened portion and blow into the open end of the tube. For tube bending it is best to use a luminous flame. The soot deposited aids in the annealing by preventing a too rapid cooling. Another method of annealing is to wrap the heated portion in raw cotton and let it cool thus.

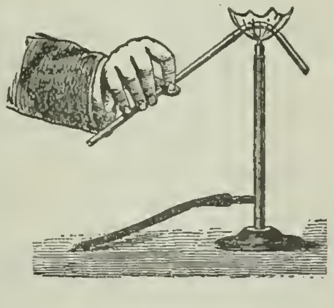

Fig. 9.—Bending Glass Tubing.

Taking the Reaction.—It is often important to know whether a substance which is being worked upon is acid or alkaline in character. This is determined by "taking the reaction," as it is called, by means of an *Indicator* By an indicator is understood a reagent which undergoes some marked change in appearance, usually a color change, when a particular stage of chemical equilibrium has been reached.

The indicator most commonly used in qualitative work is Litmus Paper, a bibulous paper colored with vegetable coloring matter known as Litmus.

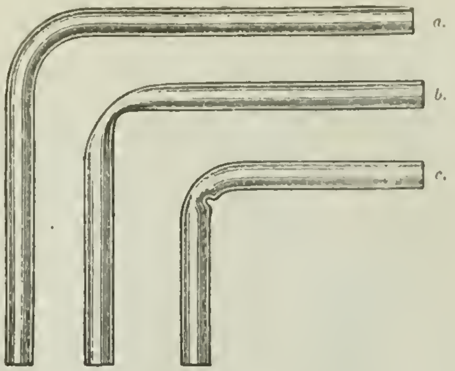

Fig. 10.—Properly and Improperly Bent Tubes.

To take the reaction of a liquid, a small portion is poured into a watch crystal and two small pieces of litmus paper, one blue and one red, are dropped into it. If the blue piece turns red, the liquid is acid; if the red piece turns blue, it is alkaline. If neither changes color, the reaction is neutral.

Another valuable indicator is a solution of Phenolphthalein in alcohol. A few drops of this turns an alkaline solution to purplish red. With acids the solution is colorless. Like litmus, it is also to be had in the form of paper.

Collecting and Washing Precipitates.—One of the most frequent reactions which will occur during the subsequent studies will be the appearance of a solid precipitate following upon the mixture of two or more solutions. Very frequently it will be necessary to obtain this precipitate free from the liquid in which it is formed.

When the precipitate settles readily the supernatant liquid can be decanted and the precipitate washed by the addition of fresh water, which is again poured off after the subsidence. If the precipitate does not subside readily it must be separated by filtration, or passing through filter paper.

Filter paper is usually found in the laboratory in circular sheets of various sizes. To prepare a plain filter the paper is first folded across one diameter, so as to make a half circular double sheet, which is next folded at right angles to the first fold, thus forming a triangle consisting of four thicknesses of paper. If the triangle is now opened, so as to leave three layers of paper on one side, and one on the other, it will have the shape of a hollow cone, permitting it to fit easily into a funnel. (Fig. 11.) It is generally advisable to wet the paper before pouring the liquid to be filtered upon it.

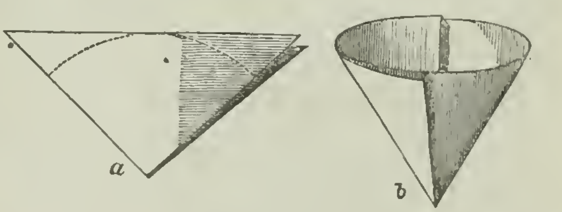

Fig. 11.—Plain Filter.

After the liquid has run through the filter, the precipitate may be washed by gently spraying water over it from a wash bottle. The neck of the funnel should rest in a flask to catch the filtrate, and wash water.

The most convenient size of filters for students' use are about 10 cM in diameter, with funnels of a size to match.

To transfer the precipitate to another vessel, puncture the point of the filter and wash it through with a stream of water from the wash bottle. Or the filter may be spread out and the precipitate removed with a spatula or knife blade.

Wash Bottle.—The most convenient wash bottle is made from a thin flask of about 500 Cc. capacity and having a flat bottom. Through a tightly fitted cork there passes two tubes, one to the bottom of the flask, the upper end pointing downward outside. The other tube merely passes through the cork with its upper portion inclined to one side. (Fig. 12.) By blowing into the latter the liquid in the flask will beforced upward and out through the longer tube in a fine stream that can be directed upon a funnel or into a test tube.

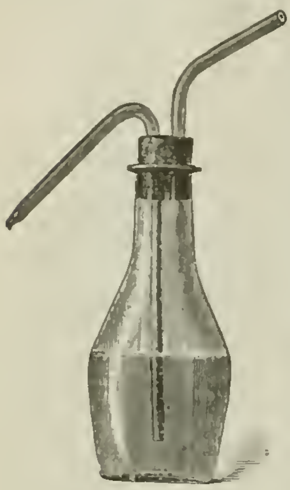

Fig. 12.—Wash Bottle.

Collecting Gases.—When a gas is required to be free from air, it is collected by displacement. The vessel in which the gas is to be collected is filled with water, covered with a piece of glass or cardboard, inverted, its mouth immersed in water and the card or glass withdrawn. The gas is then led from the generator through a tube under the mouth of the flask and rising into the latter displaces the water. When the liquid has all been displaced, the mouth of the vessel is again covered under water, and returned to an upright position with the cover still in place. (Fig. 13.) If the gas is soluble in water, mercury may be used instead. When freedom from air is not essential the delivery tube from the generator may simply be introduced into the vessel in which the gas is to be collected.

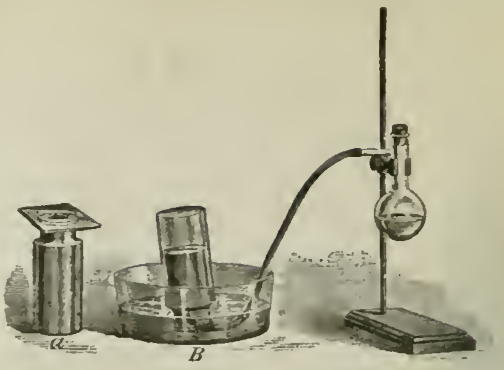

Fig. 13.—Collecting Gases.

The Use of Reagents.—The tendency among inexperienced students is to use reagents in excess, and thus not only add unnecessarily to the expense of the work, but in many instances to interfere with the sharpness and delicacy of the reaction.

In the use of the common liquid reagents from 3 to 5, or at most 10 Cc., will be sufficient in the majority of cases. Frequently only a few drops will be required.

When two liquids are to be mixed, the first may be placed in a test tube, and the second added, *drop* by *drop* until the desired change is effected. Strong solutions of the acids and of the alkalies should be very cautiously added, lest an excessive quantity be introduced and the desired reaction prevented.

While many other manipulations will be employed besides those described here, the directions for their performance can best be given in connection with the particular experiments in which they occur.

LECTURE 14.

Pharmaceutical Physics.

Sound.

While the subject of sound may not be very closely connected with pharmaceutical operations, it is nevertheless a matter of so much general importance that the student can well afford the brief study necessary to acquaint himself with the general principles of the science.

Sound and Sound Sensation.—Commonly the term sound is used to designate both a peculiar sensation and the physical cause of that sensation. However these two meanings may be confused in conversation, they must be carefully distinguished in scientific discussion.

The sensation of sound is purely subjective and has no existence outside of the brain of the sensitive subject; the cause of that sensation is external and objective, and exists independent of ear or brain.

In the brief discussion which follows we shall confine ourselves mainly to a consideration of sound in its objective sense, or to the physical agency which gives rise to the sensation.

Definition of Sound.—A sound traced to its source will always be found to originate in a vibrating body, or a body which in whole or in part is in a state of rapid motion to and fro. When the vibration ceases the sensation of sound also ceases.

Investigation also shows that there is always a medium between the vibrating body and the ear of the sensitive subject, and that this intervening medium is set in vibration by the sound producing object and reproduces these vibrations upon the ear. A sound therefore consists of mass vibration, capable of transmission to the ear and of producing a sound sensation.

Nature of a Sound Wave.—It is ascertained by experiment that when a medium is in the act of transmitting sound vibration its parts are alternately in a state of condensation and rarefaction. Conceiving the vibration to originate at any particular point, it advances outward in all directions in a sphere, or series of spheres, a zone of rarefaction succeeding one of condensation, and growing larger as they recede from the point of origin. A condensation and rarefaction taken together constitute a sound wave. (Fig. 41.)

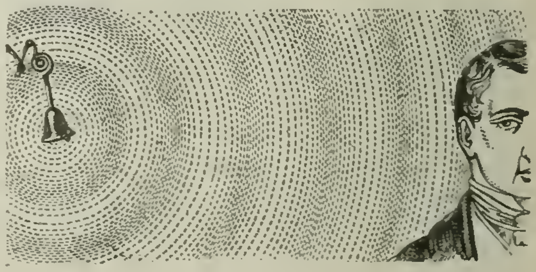

Fig. 41.—Sound Waves.

Propagation of Sound.—That sound requires an appreciable time to travel through space is evident from observing the time which elapses between the escape of steam from a distant locomotive and the arrival of the sound of the whistle.

The velocity of sound propagation varies with the nature of the medium through which it travels, increasing with the elasticity and decreasing with the density, or, as expressed in the law, *the velocity of sound varies directly as the square root of elasticity and inversely as the square root of the density.*

In free air at 0° C. the velocity of sound is 332.4 M. per second. Rise of temperature increases elasticity and decreases density, and consequently increases the velocity of sound propagation at a rate amounting to 0.608 M. for each rise of 1° C. in temperature.

When both the elasticity and density of a medium vary together and in the same ratio, the velocity of sound waves is not affected by the change.

On account of their greater incompressibility and consequent greater elasticity, sound waves travel faster in liquids and solids than in gases, notwithstanding their greater densities. Thus, in water the velocity of sound is about four times, and in glass and iron about sixteen times, as great as in air.

Reflection of Sound Waves.—That sound waves may be reflected is familiar to every one who has listened to an echo. Not only may walls and hills reflect sound, but bodies of timber, clouds, fogs, etc.

By means of the echo we may determine the approximate distance of objects by noting the time between the shout and the return. For example, if in zero weather the echo should return in one second after the sound, then the wall or object is 166.2 M. distant, since in passing to the wall and back again the sound waves would have traveled 332.4 M., the velocity of sound at 0° C.

In order that the echo shall be distinct the reflecting surface should be so distant that the return sound should not follow closer than within about one-fifth of a second after the original sound, otherwise the sound will be indistinct or blurred, an effect sometimes noticed in speaking in a vacant audience room.

The reflection of sound may be shown by placing two concave mirrors facing each other, and some distance apart, and suspending a watch in the focus of one when by means of a funnel or curved tube the sound of the ticking may be heard at the focus of the other mirror, though inaudible at intermediate points. (Fig. 42.)

The so-called whispering galleries are rooms whose curved walls act like the concave mirrors, so that persons at opposite sides may hold conversation without being heard by those who are stationed between.

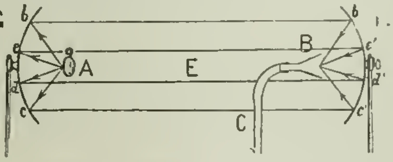

Fig. 42.—Reflection of Sound Waves.

Retraction and Diffraction of Sound.—By the refraction of sound is meant the change in direction caused by the entrance into or passing through a medium of different density. If between a source of sound, as a watch, and the ear there may be interposed a thin balloon filled with some dense gas, as carbon dioxid, the sphere of gas will operate as a double-convex lens and cause the sound waves to converge to a focus on the opposite side, where they will be heard more distinctly than at intervening points, the curvature of the waves being reversed in their passage through the denser gas. (Fig. 43.)

When sound waves strike the edge of an obstacle, secondary waves are set up which pass behind the object, so that the latter only partially forms a "sound shadow." This bending of the waves around a corner is called *Diffraction.*

Difference in Sound Sensations.—Sound sensations differ in Loudness, Pitch and Quality.

Loudness, or intensity, depends upon amplitude of vibration, or the distance the air particles in a sound wave swing on each side of a middle line. Since amplitude or length of swing depends upon the energy of the sound vibration, loudness may be said to depend upon the energy of the sound vibration. The more energy the latter possesses, the harder the impact it makes upon the organ of hearing, and hence the stronger the sensation.

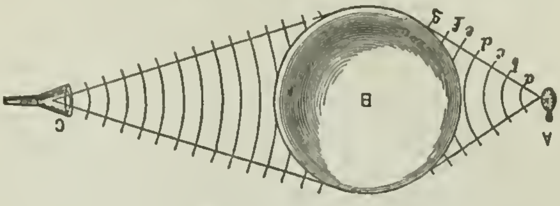

Fig. 43.—Refraction of Sound Waves.

Effect of Distance on Loudness.—As previously stated, sound waves advance in the form of a sphere which continually grows larger as the point of origin is receded from, consequently the intensity of the sound must continually diminish. Since the surface of a sphere varies as the square of its radius, i. e., that doubling the radius increases the surface of the sphere four times, it follows that doubling the distance from the origin of a sound must diminish its loudness to one-fourth, because the same volume of sound is now spread over four times the area, or, as the law is commonly expressed, *Loudness, or intensity, varies inversely as the square of the distance.* Increasing the distance three times would diminish the loudness to one-ninth, since the sound would now be distributed over nine times the surface, etc.

This is known as the law of Inverse Squares, and applies in all cases where either matter or energy is distributed from a center in the form of a sphere.

Reenforcement, Consonance and Resonance.—Loudness also depends upon the mass of air which is thrown into vibration. If a tuning fork held in the hand, or a string tightly stretched from the ceiling, be set in vibration, the resulting sound is audible only when the ear is close by the vibrating body. If the stem of the fork be touched to a table or held against an empty box, the object touched will give out a loud sound corresponding to the note of the fork, or if the string be fastened to a board or across a box, a loud sound will also be heard. The fork or string is itself unable to set sufficient air in vibration to strongly affect the ear, but is capable of communicating its vibrations to the table or box which in turn sets a larger mass of air in vibration. This reenforcement of the sound is known as *consonance,* or when the re-enforcing body is tuned in unison with the sounding body, as *resonance.*

The hollow bodies of guitars and violins and the frame upon which piano wires are strung are for the purpose of acting as "sounding-boards" or resonators.

Interference.—We know from experience that if two water waves equal in height and intensity collide while going in opposite directions they will mutually destroy each other. If they are unequal, the smaller wave will be obliterated, and what is left of the greater wave will continue on in its own direction. If the two waves are moving in the same direction they will be added together and form a new wave equal to the sum of the two.

It has been shown by experiment that the same is true of sound waves. If they meet in opposite phases one is neutralized by the other, and if they are equal in intensity they may produce silence. If they meet in similar phases the effect of the one is added to the effect of the other and a louder sound is produced. Such effects are known as Interference effects, one of the most prominent of which is the production of beats in music, a peculiar throbbing effect due to the fact that part of the waves interfere to produce silence, while others coincide to increase the loudness.

Sympathetic Vibrations.—If a tuning fork in vibration be brought near to another tuned to the same pitch, the second fork will in a few moments be found also in vibration. In like manner, if a note be sung into an open piano, the same note will be reproduced in the body of that instrument, and if the strings which produce that note are touched they will be found to be also in vibration. Such effects are known as sympathetic vibrations, and are caused by the beating of the sound waves upon the fork or wires which vibrate in the same period, while forks or strings of different periods remain unaffected.

Pitch.—The character of a sound as to its being high or low, acute or grave, is known as *Pitch*, and depends upon the number of sound waves which reach the ear in a second. The greater the number of vibrations per second, the higher or more acute the pitch, and vice versa. This can be shown experimentally by an instrument known as Savart's Wheel, a circular disk with a toothed edge which can be made to turn against a piece of cardboard. As the wheel turns slowly a series of distinct taps is heard, which as the velocity of the wheel is increased gradually blends into a continuous sound of increasing shrillness, the sound again becoming grave or low when the rate of rotation is lessened.

Quality.—Quality is that character of a sound which enables one to distinguish the source from which it comes, and depends upon the *forms* of the sound waves. Just as a large water wave may have smaller waves over its surface, so a long sound wave may also be the subject of smaller vibration of its parts. In fact all ordinary sound waves are compound vibrations, or long sound waves which are also vibrating in parts, hence all ordinary sound sensations are complex instead of simple sensations. The principal note produced by a string, tuning fork, or other vibrating body is known as the *Fundamental*, and would have the same character when produced by any instrument. The smaller vibrations just spoken of, however, also impart their own notes to that of the fundamental. As the character of these secondary vibrations varies with each kind of instrument any given note, as C, for example, will have a different character when produced by a piano from what it would have when produced by an organ or violin. This difference in sound sensations due to variation in the sound wave is known as quality.

Difference Between Musical Sounds and Noise.—If the air be dealt a single impulse, as by the blow of a hammer on a board, the ear likewise receives a single unmusical impulse which we call a noise. If the impulses are repeated with equal intensity so that the ear is unable to distinguish between them the resulting sensation is spoken of as a musical sound. This may be shown by holding the edge of a card against the teeth of a revolving wheel. When the wheel turns slowly the separate strokes of the teeth on the card are heard as distinct taps, but blend into a continuous musical sound as the speed of the wheel is increased.

There is, therefore, no difference in the nature of noise and musical sound. When the vibrations are regular and sufficiently rapid the resulting sensation is agreeable and is called musical. When they lack these characters the result is called noise.

The musical scale consists of eight notes, the first of which, middle C, is caused by 261 vibrations per second, and the eighth note above, or the *octave*, by twice as many, or 522. The vibration numbers of the intervening notes bear definite ratios to each other, and are represented by the following numbers: $1 : {}^{9}/_{8} : {}^{5}/_{4} : {}^{4}/_{3} : {}^{3}/_{2} : {}^{5}/_{3}$ ${}^{15}/_{8} : 2$. This means that if the first note has 261 vibrations per second, the next will have $261 \times {}^{9}/_{8}$, the third $261 \times {}^{5}/_{4}$, and so on to the eighth which would be 261×2.

Musical Instruments.—Musical instruments may be ranged in three classes according to the method in which the sounds are produced. 1. Wind instruments, in which the sound is produced by a vibrating column of air, as the pipe organ, cornet, flute, etc. 2. Stringed Instruments, in which the sound is due to vibrating strings re-enforced by a sounding-board, or air cavity, as the harp, piano and violin. 3. Instruments in which the vibrating part is a membrane or plate, as the drum, etc.

Ranges of the Voice and Ear.—Sound waves may be of any length, and of any number of vibrations per second, but the human larynx is restricted to the creation of only a limited number of notes, and the human ear is likewise capable of hearing or responding to sound vibrations only within certain limits.

The voice is usually confined to the production of notes lying between 61 and 1,305 vibrations per second, or a range of three octaves. Exceptional voices may exceed these limits.

The ear is capable of perceiving sound vibrations between 32 and 38,000 vibrations per second, or about 11 octaves. For ears having these limits, notes produced by fewer than 32 or by more than 38,000 vibrations per second would be inaudible. Occasionally persons are found who can perceive notes produced by as few as 16 or as many as 50,000 vibrations per second. Such persons are able to recognize sound where to others there is only silence.

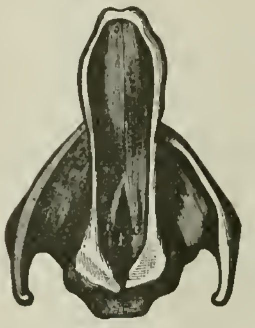

Fig. 44.—The Larynx, Showing Vocal Cords.

The Vocal Organ.—The vocal organ consists of a cartilaginous box, the larynx, situated at the top of the trachea, and having stretched across its cavity two folds of elastic tissue known as the vocal cords. (Fig. 44.)

When not in action the vocal cords are relaxed so as to permit freedom in respiration.

When sound is to be produced the cords are stretched by the motion of the movable cartilages to which they are attached, and a blast of air sent between from the lungs, sets them in vibration. The more tightly the cords are drawn the higher the pitch of the sound produced.

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The mouth and nasal cavities act as resonators to reenforce the sounds produced by the vocal cords. Articulation consists in the modification of the size and form of the resonant cavity so as to produce modification in the sounds produced.

The Auditory Organ.—The auditory organ consists of an external ear, or auricle, conducting by means of the auditory canal to the middle ear or drum. The latter is an air cavity, and contains a chain of three small bones which connects it with the inner ear located entirely within the substance of the temporal bone. The air inside the drum is kept at the same pressure as the external atmosphere by means of the eustachian tube, a narrow canal connecting the ear drum with the throat cavity.

The inner ear consists of three connected cavities, the vestibule, the three semi-circular canals, and the cochlea, a tube coiled on itself like a snail shell. These three cavities are filled with a limpid liquid known as lymph, and the interior of the cochlea contains several thousand hair-like projections, the rods of Corti, each of which is connected at its base with a filament from the auditory nerve. (Fig. 45.)

When a sound wave enters the auditory canal it sets the outer wall of the ear drum in vibration, and this by means of the chain of small bones is conducted to the middle ear and sets up a corresponding disturbance in

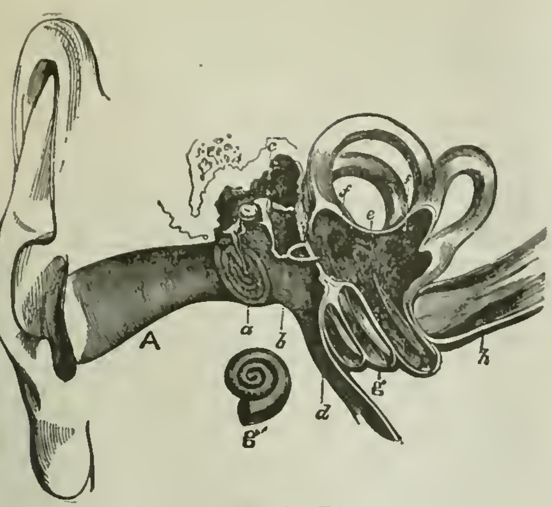

Fig. 45.—The Ear.

the lymph therein contained. The rods of Corti, it is presumed, are set in sympathetic vibration by the lymph waves, and the nervous impulses thus created are transmitted through the auditory nerve to the center of hearing in the brain, where they give rise to the sensation which we term sound.

PRACTICAL STUDIES.

Prove that sounding objects are in vibration by touching with the finger the side of a bell, tumbler, mortar or other object which has been struck with a hard object. What is the effect of stopping the vibration?

Suspend a watch by a string and note how far it can be heard through air. Next lay the watch on a counter and note how far it can be heard by placing the ear close to the surface upon which it lies. Try other surfaces, as a glass showcase, etc. Which is the best conductor?

Fasten one end of a smooth, stout string about 1 M. long to a nail or hook in a wall, stretch it tightly with one hand, and set the string in vibration by plucking it with the other hand. Note the loudness of the sound. Next fasten the string across the open side of a large box, and again set it in vibration. How is the loudness affected?

How is the "pitch" of the sound affected by decreasing the length of the string, or by stretching it tighter?

OUR TRADE WITH LATIN AMERICA.

By GONZALO O'NEILL.

Shrewd statesmen of well established national reputation, such as James G. Blaine, whose death a few years ago closed the most brilliant career of any public man of modern times, have never overlooked the importance and almost the necessity of giving impetus to our commercial life with those vast and rich regions which are closely bound to us by historical events, and still more by the similarity in the forms of government, since the honest Emperor Dom Pedro was forced from the Brazilian throne.

Not long ago, through the combined efforts of an influential element composed of true and patriotic Americans, delegates from the different Latin Republics were cordially invited to take part in the first American international conference which, though costly to the nation, was, and is painfully acknowledged to have been hardly a success. Such discouraging results have been attributed to different reasons. Some are of the opinion that the original plan was not carried out, while others firmly believe that the wound yet fresh and painful in the hearts of the Latin Americans, inflicted in that shameful struggle in which the eagle of Hidalgo was left almost featherless, serves as a barrier to the future foment of our relationship with the Spanish-speaking people.

But no; that feeling of hatred and deep love for vengeance has entirely died away, and the Latin Americans of to-day are not the people of thirty years ago. They have progressively advanced to a wonderful stage of development in the different branches of science and of industry, and when the human mind is purified by intellectual and moral advancements, vengeance and hatred no longer influence our acts.

If, in search of a more practical and satisfactory explanation, we make a careful study, it will be promptly discovered that the real fault lies at our own doors.

Let us restrict ourselves to those trades most interesting to the reader, for instance, drugs, pharmaceutical products, surgical instruments, etc., and we easily find that they have been grossly neglected by our manufacturers, while in England, Germany and France are today owners of the most extensive part of them as the natural and profitable remuneration of the incessant battle for propaganda carried on at all times on the field to create the proper demand. The American drug traveler who visits Mexico and Central and South America cannot help experiencing a feeling of deep disappointment when he observes that the shelves of every drug store are packed with European goods, while the United States is represented on a very small scale. That a good many of our articles are far superior to those of European make is extensively acknowledged by competent authorities and by the world at large, but if the American manufacturer does not show the merit of what he makes to the consumers of Latin America and interest himself in creating the proper demand for his products, he cannot justly expect results, especially when the efforts of others are not even seconded by his own efforts or favored by his co-operation.

The terms of harmony which reign between those countries and the United States to whom they look as their protector in all international controversies with Europe, the navigation facilities and other means which we have to easily reach them; our almost analogous gubernative constitution, and other important and favorable circumstances, offer to the American manufacturer unusual advantages to give great increment to business and gradually divert from Europe a large fraction of the enormous business done with Latin America, and which amounts to nearly $150,000,000 annually.

USE OF ACETYLENE.—Additional information is furnished in the simple method devised by A. E. Murphy, of Essex, England, for blowpipe work and in atmospheric burners, and communicated by him to Nature (Sci. Am.). An ordinary Bunsen burner of special dimensions is employed, with a very small jet for the gas—this for the laboratory—and the burner tube is covered with a cap to exclude dust when the burner is not in use. The acetylene is generated under about seven or eight inches water pressure; with six inches pressure a perfectly clean flame of good size can be obtained, the flame burning steadily and noiselessly, with a consumption of about one cubic foot of the gas per hour. The flames are found to be possessed of great heating power, one volume of acetylene being for practical purposes nearly twice as effective as one volume of ordinary gas. This, it is declared, means an immense saving of time in all heating operations, and in many cases the use of a blowpipe can be dispensed with, the burner alone being quite hot enough for small fusions and simple glass making operations.

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Registration in Kentucky.

(J. C. W.) See this journal, July 29, 1897, page 143. The Kentucky Board of Pharmacy does not register without examining the licentiates of other boards of pharmacy.

Hard Coating for Rubber.

(O. S.) asks if the formulas for hard rubber coating given in this journal, Aug. 19, 1897, page 239, will do for coating rubber wading boots which are full of minute holes. Yes. Try formula No. 1 or 2.

Transparent Mirrors.

(C. E. M.) The "translucent platinic mirror" described by you and shown in the French section at the Columbian Exposition in 1893, is made by a patented process, the inventor, we are informed, being M. M. Dodé, Reims, France. We cannot give the details.

Liquor Sedans.

(G. H.) Each fluid ounce of this preparation is said by the manufacturers to represent: black haw and golden seal, 60 grains each; Jamaica dogwood, 30 grains; combined with aromatics, q. s. We cannot give the working formula.

Interchange of Certificates.

(D. F. J.) Write to the secretary of the Board of Pharmacy of the State in which you desire to register. He can tell you officially whether his particular board will grant you registration without examination upon the certificates of the South Dakota and Minnesota boards of pharmacy.

Ferrous Sulphate and Nitric Acid.

(G. L. M.) asks how the following may be dispensed:

Ferrous sulphate,	
Nitric acid, of each	1 dram
Quinine sulphate	1 dram
Potassium citrate	1 dram
Mint water, to make	8 ounces

Dessertspoonful thrice daily.

We should dispense this prescription by first mixing the ferrous sulphate with the nitric acid, allowing the mixture to stand until effervescence ceases. This procedure, of course, converts the ferrous sulphate into a ferric salt, but the reaction probably does not interfere with the therapeutics of the mixture. To the solution thus made add the mint water, in which the potassium citrate has been previously dissolved. Lastly dissolve the quinine sulphate in the mixture.

Yellow Oxide of Mercury Ointment.

(Z. T. H.) submits the following:

Yellow oxide of mercury	2 grains
Petrolatum	2 drams

Mix and use as an eye salve.

He says he filled this prescription for a customer and after a week or so the ointment turned brown, nearly black, and it became painful to the eyes.

The change in color is due to a reduction of the yellow oxide of mercury, probably caused by impurities in the petrolatum. Ointment of yellow oxide of mercury is very susceptible to the action of light, but reduction such as described hardly ever takes place in so short a time. For this reason the ointment should be freshly made when wanted for use. If this petrolatum answers the pharmacopœial tests it will not cause an alteration in the color of the mercurial. We suggest examination of the former.

Flashlight Powder.

(F. A. G.) See this journal, March 18 and April 8, 1897, pages 353 and 422, respectively. The British Journal of Photography describes the following apparatus for burning flashlight powder: A square metallic spirit lamp, having a flat top, is fitted with two wicks, one in front of the other, and separated by two or three inches. Immediately behind this lamp is a short, wide-mouthed bottle containing magnesium in powder. Dipping into this powder is a glass tube, the other end being carried up through the cork and bent toward the flames of the spirit lamp, which are in a line with the direction of the blowpipe. A second short piece of tube is passed through the cork, its outer end being connected with the rubber tube of a pneumatic ball. On giving this ball a quick, sharp squeeze, a small quantity of the powder is suddenly ejected from the blowpipe nozzle against the flames, this being attended by a dazzling flash. This is capable of being repeated as long as any of the magnesium powder remains in the bottle.

Calomel Combinations.

(G. L. M.) The choice of a purgative to combine with calomel should be indicated by the physician. The purgatives generally chosen are jalap, rhubarb, aloes, scammony, colocynth and gamboge. Hare says calomel when used as a laxative purge should be given in doses of 1/6 to 1/2 grain every half hour, or every fifteen minutes until 1 or 2 grains are taken; it will act as efficiently in this way as if 10 grains are given at one dose, and there is no danger of producing ptyalism. The reason that small doses are as efficient as large ones lies in the fact that only the calomel which is changed into the gray oxide is active, and, as the amount of alkaline juice in the intestine is small, only a minor part of a large dose of calomel acts, the major portion escaping unchanged. This is the reason that bicarbonate of sodium is added to calomel powders, to aid the intestinal juice in the reduction of the salt. If purgation does not occur after a dose of calomel, a saline purge may be given at the end of twenty-four hours, and this must always be used if large doses of the mercurial are employed, to avoid possible mercurialization (Hare).

Varnish for Negatives.

(P. C. S.)

1.)	Shellac	1¼ ounces
	Mastic	¼ ounce
	Sandarac	1¼ ounces
	Oil of turpentine	¼ ounce
	Venice turpentine	¼ ounce
	Camphor	10 grains
	Methylated spirit	20 ounces
2.)	Sandarac	16 ounces
	Venice turpentine	4 fl. ounces
	Oil of turpentine	8 fl. ounces
	Methylated spirit	160 ounces
3.)	Orange shellac	4 ounces
	Canada balsam	60 grains
	Methylated spirit	16 ounces

Dissolve, and add sufficient stronger water of ammonia (.880) to dissolve the precipitate first formed.

To apply the varnish, warm the negative in front of the fire till hot enough to be comfortably borne by the back of the hand, and pour sufficient varnish over the plate to half cover it. By rocking the plate the pool of varnish is made to flow all over, and the superfluous quantity returned to the bottle by one corner. The plate is then carefully dried before the fire. Negative varnish is used to prevent accidental injury or damage from the effects of moisture.

The Era Course in Pharmacy

J. H. BEAL, Sc.D., Ph.G., Director.

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THE ERA COURSE IN PHARMACY is a thorough, practical and economical course of home study in pharmacy, and covers the subjects usually embraced in the curriculum in a standard college of pharmacy. It is designed for all who desire systematic instruction in pharmacy; for clerks who cannot attend college; for those preparing for pharmacy board examinations; as auxiliary course for students in college, and as a means of review for graduates and experienced pharmacists.

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FEES. The entire expense is only $7.75 per annum and includes subscription to the ERA, tuition fees and a binder fo preserving copies and lectures.

LECTURE NO. 17.

Inorganic Chemistry.

The Halogens.

IMPORTANT TO STUDENTS.

Some students in answering the questions use more than the regular recitation blanks, often half a dozen or more additional sheets of paper. If they wish these additional sheets returned by the quiz master they must enclose sufficient postage, which on this class of mail matter is 2 cents per ounce, whether sealed or unsealed.

FLUORIN. CHLORIN. BROMIN. IODIN.

The Chlorin Group embraces four members remarkable for their chemical activities, for the well marked chemical relationship which subsists between them, and for the pharmaceutical and chemical importance of the free elements and of their compounds. The term halogen means literally, *salt producer*, and is probably derived from the Greek *hals*, a salt, and *gennao*, to generate, since the principal source of one of the members, chlorin, is common salt. Their binary compounds with the metallic elements are known as the haloid salts, or still more simply as the *halides*. Their compounds are widely distributed through nature and in considerable quantities.

FLUORIN.

Symbol F. Valence 1. Atomic Weight 19. Specific Density 19.

Historical.—Compounds of fluorin have been known and their properties observed since the 17th century, but the element itself was not obtained in the free state until 1886. The name is from fluor spar, its most common compound, which derives its name from the Latin *fluo*, I flow, in allusion to the fact that it is used as a flux in the extraction of metals.

Natural Sources.—Fluorin is found combined in nature in the fluorids, chiefly as calcium fluorid, or fluor spar, CaF_2, and in cryolite, AlF_3, $3NaF$, a mineral found in great quantities in Greenland. It also exists in small quantities in sea water, in the water of certain mineral springs, and in the teeth, bones and other tissues of the mammalia. It is also stated to occur free in minute quantities in the cavities of certain crystals of fluor spar.

Preparation.—Fluorin resisted all efforts to isolate it until obtained by Moissan in 1886, by the electrolysis of anhydrous hydrofluoric acid, at a low temperature, in a vessel of platinum with stoppers of fluor spar. All previous efforts had been frustrated by the intense activity of the element which caused it to combine as fast as released with the material of the vessel in which it was freed.

Description and Physical Properties.—Fluorin is described as a pale yellow, or colorless gas, with a penetrating and intensely irritating odor resembling that of hypochlorous acid.

Chemical Properties.—Fluorin is chemically the most active element known, and combines energetically with almost every other element. With many metals and organic substances it combines so vigorously as to yield the essential phenomena of combustion, light and heat, and hence, like oxygen, may be said to be a supporter of combustion, except that in this respect its energy far exceeds that of the latter element. It is said that a substance like cork dropped into the element takes fire instantly. At ordinary temperatures it unites readily with boron, silicon, and sulfur, but does not attack gold, platinum, or oxygen. It readily attacks glass and other silicates, forming the gaseous silicon tetrafluorid, SiF_4. It instantly decomposes water, uniting with its hydrogen to make hydrofluoric acid, and setting the oxygen free in the form of ozone. With hydrogen it unites explosively, even in the dark and at a low temperature.

Hydrofluoric Acid, HF.—Fluorin forms one compound with hydrogen, known as Hydrofluoric Acid, HF, (or H_2F_2). The free acid is a colorless liquid, boiling at 19.4° C. and only less active than the element itself. The commonly known "hydrofluoric acid" is an aqueous solution and reacts energetically with many elements, and attacks and dissolves glass, combining with the silica to form the volatile silicon tetrafluorid, SiF_4. It is prepared by decomposing a fluorid, usually calcium fluorid, by sulfuric acid and distilling from a platinum or lead still (Fig. 18), the following reaction taking place:

$$CaF_2 + H_2SO_4 = CaSO_4 + 2HF.$$

On account of its action on silica, the solution must be

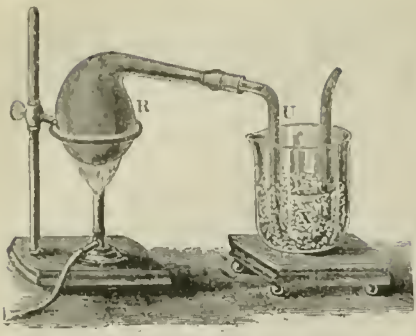

Fig. 18.—Preparation of Hydrofluoric Acid.

preserved and transported in vessels made of platinum, lead, guttapercha, ceresin, etc. Extreme caution must be observed in handling the acid, since when brought into contact with the skin it produces dangerous sores very difficult to heal. The vapor is also dangerously poisonous when inhaled.

From variations in its vapor density, the gaseous acid is presumed to have the formula, H_2F_2 at and below 30° Centigrade. This is further rendered probable by the fact that acid fluorids, as KHF_2, are known, which would not be possible if the molecule contained only one atom of hydrogen. At 100° C. its vapor density corresponds to the formula, HF, which is the formula commonly made use of to represent the acid.

Hydrofluosilicic Acid, H_2SiF_6.—When silicon tetrafluorid is conducted into water it decomposes with the production of fluosilicic or hydrofluosilicic and silicic acids.

$$3SiF_4 + 4H_2O = 2H_2SiF_6 + Si(OH)_4.$$

The acid solution can be separated from the gelatinous silicic acid by straining, and concentrated by evaporation. It is an unstable compound, and breaks up at a boiling temperature. It is of little importance.

No oxygen compounds of fluorin are known.

Uses.—The principal use of hydrofluoric acid depends upon its affinity for silica, which makes it a valuable agent for engraving the scales upon thermometers, and other articles of glassware. The article to be etched is first covered with some such substance as paraffin or beeswax, and the design scratched in the film so as to expose the glass. The article is then supported over a vessel containing the aqueous acid, and the acid fumes as they arise attack and dissolve the exposed portions of the glass. The reaction which takes place may be represented as follows:

$$SiO_2 + 4HF = SiF_4 + 2H_2O.$$

PRACTICAL STUDIES.

In a leaden dish, or in a porcelain dish which has been lined with tinfoil, place some powdered fluor spar. Place a small lump of beeswax or paraffin on a small plate of glass and heat, at first very gently, until the glass is completely covered with a thin film. Let cool, and with a sharp instrument trace your name or some other design through the wax. Now pour a little sulfuric acid over the powdered fluor spar, stir it together with a bit of stick, and lay the plate, waxed side down, over the dish. Set away for several hours or until the next day, then with a knife blade clean away the wax. Unless the design was clearly traced through to the glass, the acid will not have etched it.

Avoid inhaling the fumes from the dish, or getting any of the mixture of fluor spar and acid on the hands or clothing.

CHLORIN.

Symbol Cl. Valence 1, 3, 5, 7. Atomic Weight 35.37.
Specific Density 35.37.

Historical.—Chlorin was discovered by Scheele, of Sweden, in 1774, and for a long time was regarded as a compound of hydrochloric acid with oxygen. In 1801 Sir Humphrey Davy established its elementary nature and named it from the Greek *chloros*, green.

Natural Sources.—Chlorin occurs in nature combined as chlorids of the metals, chiefly as the chlorids of sodium, potassium and magnesium. The most abundant source is sea water and deposits of rock salt, which have probably resulted from the evaporation of former portions of the sea.

Preparation.—1. By electrolyzing hydrochloric acid or a solution of its chlorids.

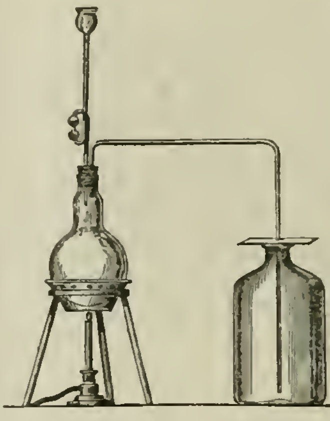

Fig. 19.—Preparation of Chlorin.

2. By the action of hydrochloric acid on a peroxid, as manganese dioxid, MnO_2, or some other strong oxidizing agent. (Fig. 19.)

3. By the action of sulfuric acid on a chloid in the presence of a peroxid. This process is essentially the same as the preceding, as hydrochloric acid is first set free from the salt and then reacts upon the peroxid.

4. On the commercial scale chlorin is prepared in large quantities from the hydrochloric acid product as a by-product in the Leblanc soda process. Of the several methods employed, one is the Weldon process, by heating the acid with manganese dioxid, the Deacon process, or the decomposition of the acid by passing it over heated bricks saturated with sodium and cupric sulfate, besides several others which need not be mentioned.

Description and Physical Properties.—Chlorin is a greenish yellow gas, becoming darker when heated, heavier than air, and of a penetrating, suffocating and corrosive odor, irrespirable, and poisonous if undiluted. At —40 C. and atmospheric pressure it can be condensed to a yellow liquid. It is 35.37 times heavier than hydrogen. Water at 10° C. dissolves about two and a half times its volume of the gas, yielding a greenish yellow solution. Above this temperature the solubility decreases and at 100° it ceases to dissolve any. Near the freezing point the element unites with water to form a crystalline hydrate having the composition $Cl+5H_2O$, which on standing gradually decomposes into chlorin and water.

Chemical Properties.—Chlorin unites directly with nearly all other elements, in many cases with so much energy as to yield the essential phenomena of combustion, light and heat, especially if the added element be in a finely divided state.

Chlorin is remarkable for its powerful bleaching effects upon organic colors. This occurs only in the presence of moisture and is an indirect reaction. The chlorin through its strong affinity for hydrogen, decomposes the water into its constituents and unites with the hydrogen to form hydrochloric acid, while the released oxygen attacks the coloring matters, oxidizing them to colorless compounds. It is no doubt to this power of setting free oxygen that chlorin largely owes its valuable disinfecting and deodorizing properties.

A mixture of hydrogen and chlorin may be kept for years unchanged, if prepared in the dark, but upon being brought into a bright light the gases unite with explosive violence, hydrochloric acid being the product.

COMPOUNDS OF CHLORIN.

Chlorin forms one hydrogen acid, HCl; three instable oxids, Cl_2O, Cl_2O_3,ClO_2, and four more or less stable oxygen acids, HClO, $HClO_2$, $HClO_3$, and $HClO_4$.

Hydrochloric Acid.—A colorless gas of strong and irritating odor, somewhat resembling chlorin. An aqueous solution of this gas, more or less pure, and of varying strength, constitutes the hydrochloric acid of the laboratory and of commerce. Hydrochloric acid is formed when chlorin acts upon compounds containing hydrogen. It is prepared commercially as a by-product in the Leblanc soda process. In this manufacture immense quantities of sodium chlorid are treated with sulfuric acid, forming sodium sulfate and hydrochloric acid. The latter is then conducted through towers filled with coke, down which a stream of water is passing. The water dissolves the gas, and is drawn off at the bottom as the hydrochloric acid of commerce. As prepared in this way the acid is impure and colored by iron and organic matter. The pure acid, which is colorless, must be prepared from pure materials. The reaction may be represented as follows:

$$2NaCl + H_2SO_4 = Na_2SO_4 + 2HCl.$$

The amount of the gas dissolved by water depends upon the temperature and pressure. At 0° C. and atmospheric pressure water dissolves 503 volumes, forming a solution containing 43 per cent. of the acid. At a pressure of one atmosphere, a solution which contains 20.24 per cent. remains constant. If a solution containing a greater amount than this be heated the gas evaporates till it reaches the strength of 20.24. If the solution is weaker than this the water evaporates and the solution grows stronger until the same strength is attained.

Uses.—Immense quantities of hydrochloric acid are used in the arts and manufacturing chemistry. It is the main source of chlorinated lime, and in the pure state in the manufacture of pharmaceuticals and as a reagent in the laboratory.

Characteristic Reactions.—A characteristic reaction of hydrochloric acid and soluble chlorids is the yielding of insoluble white chlorids when added to solutions of silver, lead and mercurous salts. Lead chlorid is sparingly soluble in cold water, freely so in hot water. Silver chlorid is insoluble in water and acids, but dissolves in ammonia water. Mercurous chlorid turns black with ammonia water.

Chlorin and Oxygen.—Chlorin will not combine with oxygen directly, but in the presence of a base may be made to unite with it. The oxygen compounds of chlorin are exceedingly unstable, some of them exploding with terrific violence upon receiving the slightest shock, such as scratching or jarring the vessel containing the liquid oxid or acid, or the addition of easily combustible organic matter.

Chlorin Monoxid, Cl_2O.—When dry chlorin is passed over precipitated mercuric oxid, chlorin monoxid, Cl_2O, is formed, as follows:

$$HgO + 4Cl = HgCl_2 + Cl_2O.$$

This compound is a slightly yellow gas, whose odor resembles chlorin, and condenses under the influence of cold and pressure to an orange-colored liquid which explodes violently when warmed, or even spontaneously. In the presence of water the monoxid unites with a molecule of water to form hypochlorous acid, and may therefore be regarded as the anhydrid of the latter.

$$Cl_2O + H_2O = 2HClO.$$

The salts of hypochlorous acid, the hypochlorites, are comparatively stable, and may be formed by passing chlorin into a cold dilute solution of an alkaline hydroxid, when a mixture of hypochlorite and chlorid of the metal is formed.

$$2KOH + 2Cl = KClO + KCl + H_2O.$$

If the alkali be concentrated or hot, a chlorate is formed instead of a hypochlorite.

Hypochlorous acid and the hypochlorites are valuable as bleaching agents, owing to the readiness with which they yield free chlorin upon the addition of a weak acid. The common bleaching powder of the shops, known as "chloride of lime," but more properly as "chlorinated lime," is a mixture of calcium hypochlorite and chlorid, made by passing chlorin gas into moist calcium hydroxid.

$$2Ca(OH)_2 + 4Cl = Ca(ClO)_2 + CaCl_2 + 2H_2O.$$

There is, however, some reason to believe that the actual composition of bleaching powder varies from that represented by the above formula, but this point cannot be entered upon here.

The value of a bleaching powder depends upon the readiness with which it yields free chlorin upon the addition of an acid.

The chlorin slowly evolved by bleaching powder on standing is probably due to the action of the carbon dioxid of the atmosphere.

PRACTICAL STUDIES.

1. Place one or two grams of manganese dioxid in a test tube, add two or three Cc. of hydrochloric acid, mix well and warm. Immediately the tube becomes filled with the suffocating yellow fumes of chlorin. If larger quantities of chlorin are wanted, a flask fitted with a delivery tube should be used. (Fig. 19.) The gas being heavier than air can be collected by having the delivery tube reach to the bottom of an empty jar.

Balance the equation—

$$MnO_2 + HCl = MnCl_2 + Cl + H_2O.$$

2. Hold a narrow strip of *dry* calico in the test tube without touching the side. Note the result. Now wet the strip with water, wring it out and hold it in the tube again. Explain the reason for the different results.

3. Wet a narrow strip of filtering paper with turpentine and hold it inside of a tube in which chlorin is being actively evolved. Note that it either bursts into flame, or smokes, and that the paper becomes covered with a black deposit. (Fig. 20.) What is the black substance? On the assumption that $C_{10}H_{16}$ represents the molecule of turpentine, how do you explain the reaction which takes place?

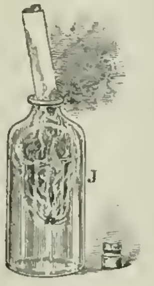

Fig. 20.—Action of chlorin on paper wet with turpentine.

4. Take a visiting card or other slip of paper with printing upon it. Cover the paper with writing fluid until the printed words are completely obscured. While damp hold in a vessel containing chlorin. How can you account for the different effect upon the printer's and writing inks?

5. Place several grams of sodium chlorid in a test tube which is fitted with a delivery tube, add two or three cubic centimeters of sulfuric acid and heat the mixture. (Fig. 21.) Pass the evolved gas into some water contained in a second tube. (Be sure to remove the delivery tube from the water before the generator tube is removed from the source of heat.) Use the solution of gas thus obtained for the next experiment.

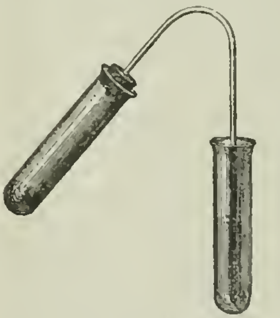

Fig. 21.—Test-tube Generator for Chlorin or Hydrochloric Acid.

Write an equation showing the reaction of sodium chlorid and sulfuric acid.

6. Place in different test tubes several cubic centimeters of solutions of silver nitrate, lead acetate, and mercurous nitrate, and to each add a few drops of hydrochloric acid or a solution of sodium chlorid. Note what occurs, and write equations showing the reactions which take place.

All but five of the total number of buildings in Austin, Pa., were destroyed by fire a few days ago, the town being practically wiped out. There were three drug stores in the place, and one of them was blown up by dynamite in an attempt to stop the progress of the flames.

IF YOU NEED HELP

in writing your advertisements, the little book, "Sample Advertisements for Druggists," will give it. It contains 180 specimens, written and illustrated to advertise drug store goods. Price 50 cents, postpaid.

LECTURE NO. 18.

Pharmaceutical Physics.

Effects of Heat.

When heat is applied to any substance we may notice any one or all of the following phenomena: Rise of Temperature, Expansion, Fusion or Vaporization.

The most common result of the application of heat is to cause a rise of temperature in the object to which the heat is applied, but the extent to which this rise in temperature takes place in any given substance depends upon its Specific Heat.

Specific Heat.—It is frequently observed that different bodies are not equally susceptible to the effects of heat, or, as commonly expressed, that different substances have different capacities for heat. For example, if a piece of iron and an equal weight of water are exposed to equal sources of heat the iron soon becomes too hot to hold in the hand, while the water is only slightly warmed. It can be shown by experiment that the quantity of heat which will raise a kilogram of water to 100° C. will raise an equal weight of iron to 900° C. or to a bright red heat. In other words, water has a greater capacity for heat than iron. The heat capacity of a substance is measured by the number of thermal units required to raise its temperature 1° C., and is always the same under the same conditions.

The ratio of the heat capacity of any substance to the heat capacity of water is called its "Specific Heat," water being selected as the standard owing to the fact that it has a higher specific heat than any other substance except hydrogen. It follows that the specific heat of all other substances will be expressed in fractional numbers. It is this property of absorbing and giving out large quantities of heat while passing through small ranges of temperature that renders water so important an agent in modifying the rigors of climate, and so valuable an auxiliary in many pharmaceutical operations.

In passing, it may be stated that the specific heat of the elements varies inversely as their atomic weights; elements which have a high atomic weight have a low specific heat, and conversely. The product of the atomic weight of an element by its specific heat is a constant quantity, nearly 6.25, consequently, dividing 6.25 by the specific heat will give approximately the atomic weight. The principal use of this law is in atomic weight determinations.

Latent Heat.—We have seen that the condition of a body, whether solid, liquid or gaseous, depends to a great extent upon the quantity of heat which it has absorbed. In the change of different substances to liquids or vapors, or back again, it is found that considerable quantities of heat are absorbed and given out *without corresponding changes in temperature*. For example, when a solid is exposed to a uniform source of heat its temperature continues to rise gradually until its melting point is reached. At this point, however, the temperature stops rising and remains without change until all of the solid has been liquefied. When the body is completely melted the temperature again begins to rise and continues until the boiling point is reached, when it again becomes stationary, and remains so until all of the liquid has boiled away, the temperature of the vapor being the same as the liquid from which it is formed.

During the time that the solid was liquefying and the liquid was vaporizing it was receiving heat at the same rate as before. If the vapor be reliquefied or the liquid resolidified, it will be found that the same amount of heat will be given out as was absorbed during the melting or vaporization. The heat which thus disappears during the change of state to one less dense is known as Latent or Absorbed Heat, to distinguish it from sensible heat or that which expands the thermometric column.

It may be stated as a general law that bodies in passing from one state to another less dense absorb or render heat latent, and that in passing from one state to another of greater density, heat is released or again given out.

Heat which becomes latent does not exist as heat, but is probably expended in doing internal work upon the molecules, whereby they are kept from assuming their usual positions.

Relation of Heat to the Three States of Matter.—Every portion of matter is subject to the action of certain forces, part of which would, if unopposed, reduce it to the gaseous or radiant condition, and others of which would reduce it to absolute solidity. The factors which determine the state in which a body exists are Heat, Cohesion, and Pressure. Most elementary substances have been, and probably all might be, caused to occupy each of the three states, solid, liquid, and gaseous, if subjected to the proper conditions of heat and pressure.

Expansion.—The force which tends to cause matter to assume a less dense condition is heat. When heat is caused to enter a body, increased motion is imparted to its molecules, causing them to move rapidly and to swing through greater distances. By this means the molecules are forced further apart, producing the phenomena of expansion.

A notable exception to the rule that heat causes expansion is found in the case of water. This liquid has its greatest density, i. e., has the greatest weight per given volume, at the temperature 4° C. Whether the temperature rises or falls from this point the result is an increase of volume. It is for this reason that ice is lighter, bulk for bulk, than the water from which it is formed.

As a rule liquids are more expansible than solids for equal additions of heat, while gases are the most expansible of all substances.

If the addition of heat is continued, the range and rapidity of the molecular motion increases until the cohesive force and the external pressure which holds the body in the solid state are completely overcome, and the substance breaks down into the liquid condition. The further application of heat will occasion an expansion of the resulting liquid, and if sufficent, may overcome the restraining forces so completely that the molecules break entirely away from the bonds of cohesion and range freely about in the state of vapor.

Effect of Cohesion and Pressure.—The forces which oppose liquefaction and vaporization are cohesion and pressure.

All bodies on the earth's surface are constantly subjected to the pressure of the atmosphere. This varies between comparatively narrow limits, but the normal pressure, at the sea level, is generally taken as 1,033 grams on the square centimeter, equal to the weight of a column of mercury one centimeter square and 760 millimeters high. (Usually given as the pressure of 15 pounds to the square inch, or the pressnre of a column of mercury of that section and 30 inches high.) Atmospheric pressure acts in opposition to the heat energy of molecules, and tends to restrain their freedom of motion and to pack them more closely together. On the other hand, the removal of atmospheric pressure has the effect of giving the molecular motions freer range and permits them to more readily assume the fluid condition. It is upon this principle that the vacuum and pressure apparatus of the manufacturing pharmacist depend for their efficiency in the various operations for which they are employed.

The Melting Point.—The melting or fusing point is the-temperature at which a solid begins to become liquid, and at which it remains until all is liquefied. When the pressure remains unchanged a substance always melts at the same temperature. The terms melting point and freezing point are generally convertible, since a liquid usually solidifies or freezes at the same point at which it melts. Commonly, however, solidification is not spoken of as freezing unless the temperature is below the solidifying point of water.

The melting point of a substance is so characteristic that it is frequently made use of as a means of identification and a test of purity, a slight admixture of foreign material being sufficient to alter the melting point to an appreciable degree.

Effect of Pressure and Admixture on the Melting Point.—The general effect of pressure is to *raise* the melting point of solids, probably by aiding the internal cohesive force in holding the molecules together, and preventing that freedom of molecular motion which is always present in the liquid state. This is not the case, however, with substances which expand at the moment of solidification, such as water. In such cases the application of pressure *lowers* the melting point, probably by assisting the internal attractive forces to bring the molecules back into the position which they occupy in the liquid state.

The effect of the admixture of solids is frequently to lower the melting point. For example, the metallic mixtures known as alloys usually melt at temperatures below the melting points of any of their constituents. The alloy known as Rose's Fusible Metal melts at 94° C., though tin, its most fusible constituent, has a melting point when fused alone, of 228° C.

The Boiling Point.—Boiling, or Ebullition, is the process of vaporization where the vapor is formed at all points throughout the liquid and not at the surface merely, and takes place only when the vapor evolved has an expansive force equal to the combined pressure of the atmosphere and the superincumbent mass of liquid. For example, a bubble forming at the bottom of a vessel of liquid must lift both the liquid above and the column of atmosphere resting on the liquid.

Under the same pressure a liquid always boils at the same temperature, and, like the melting point of a solid, is a valuable criterion of the purity of a substance. If the boiling point is above or below that determined for a pure substance or changes before the liquid boils entirely away, some impurity is present.

If the barometer is not at standard height at the time of the experiment a correction must be made for the difference of pressure.

The practical methods of determining melting and boiling points will receive consideration under the head of Pharmaceutical Processes.

Effect of Pressure and Admixture on Boiling Point.—Since boiling takes place only when the pressure of the vapor is equal to the pressure upon it, it follows that to increase the pressure raises the boiling point, while a decrease of pressure lowers it. By sufficient decrease of the air pressure it is possible to boil water at all temperatures between 0° C. and 100° C. It is to take advantage of this property of liquids that the vacuum apparatus is used in pharmacy.

As with the melting point, the boiling point is generally altered by admixture. In general, the boiling point of a liquid containing a dissolved substance is intermediate between that of the solvent and that of the dissolved substance. If the dissolved substance is a solid, the boiling point will be raised. If the dissolved substance is a liquid, the boiling point will lie between the boiling points of the liquids mixed. If the dissolved substance is a gas, the boiling point will always be below that of the solvent. If two liquids which are mutually insoluble, such as water and ether, chloroform, or carbon disulfid, are mixed the boiling point of the mixed liquids will be lower than the boiling point of either constituent.

Evaporation Below the Boiling Point.—It is a familiar fact that many substances, water, for example, vaporize below the boiling point. In such instances the vapor is disengaged at the surface only of the liquid, and there is no formation of bubbles within the body of the liquid. Vaporization of this kind may take place at all temperatures. Even a piece of ice will gradually vaporize and disappear, though all the time below the freezing point. As in the case of ebullition, evaporation below the boiling point is hastened by the application of heat and decrease of atmospheric pressure, and retarded by the reverse conditions. It is also affected by the amount of moisture already in the atmosphere and by the extent of surface which is exposed; the dryer the atmosphere and the greater the extent of surface exposed, the greater the rapidity of evaporation.

Effect of Heat on Gases.—Owing to the fact that many assay methods of pharmaceutical interest require the measurement of gases, it is of some importance to know the effect of heat upon gaseous volumes.

The effect of heat on a gas is to still further increase its elasticity and expansive force. A body of gas retained at constant pressure, will increase $\frac{1}{273}$ of its zero volume for each increase of 1° C. in its temperature. By the zero volume we mean that volume which the gas would have at 0° C.

If any quantity of a gas be heated from 0° C. to 273° C., its volume will have exactly doubled. In like manner, if cooled below 0° C., it will be found to lose $\frac{1}{273}$ of its volume for every degree of decrease in temperature, and if the rate of decrease should remain uniform (which of course it would not) at —273° C. it would have no volume whatever. This relation of the volume of a gas to its temperature is expressed by the law of Charles which is that *the volume of a gas at constant pressure is proportionate to the absolute temperature*, or

$$V : V' :: T : T'$$

where V is the original volume, V′ the final volume, T the original absolute temperature, and T′ the final absolute temperature.

The fraction $\frac{1}{273}$ is sometimes expressed decimally, as .00366, and is known as the coefficient of gaseous expansion.

Example.—A volume of gas in a nitrometer measures 60 cubic centimeters when the temperature is 20° C.; what would it measure at 15° C.?

The absolute temperatures are found by adding 273° to the Centigrade readings, which gives 293° for the initial and 288° for the required final absolute temperatures. The proposition then becomes,

$60 \text{ Cc.} : V' :: 293 : 288$, whence $V' = 58.97$ Cc.

This problem may also be worked without forming a proportion, as follows: The fall in temperature from 20° C. to 15° C. is 5 degrees. For each degree of fall the contraction would be $60 \times .00366 = 0.2196$ Cc. For five degrees the contraction would be $0.2196 \times 5 = 1.098$ Cc. 1.098 Cc. subtracted from 60 Cc. would leave 58.9 Cc. as the volume at 15° C.

If the volume of a gas is proportional to the absolute temperature, it follows that if a gas be prevented from expanding, the pressure which it exerts upon its container will also be proportional to the absolute temperature.

Since both the volume of a gas and its pressure are proportional to the absolute temperature, their product must also be proportional, or as the rule is commonly stated, *the product of the pressure of a gas by its volume is proportional to the absolute temperature*, or

$$PV : P'V' :: T : T'$$

This rule of proportion enables us to determine the change which will take place in the volume of a gas when both its temperature and pressure vary. The student must remember, however, that the laws of Boyle and Charles are exact only within certain limits, and that calculations based upon them will generally vary slightly from the results obtained by careful experiment.

Kinetic Theory of Gases.—According to this theory the pressure of a gas is due to the heat energy of its molecules. Although the impact of a single molecule upon the walls of a vessel which contains it may be inconceivably small, it must nevertheless exert a certain quantity of force. And since a very small space may contain thousands of millions of molecules, it is easy to comprehend that the combined results of their millions of impacts per second may amount to a very great pressure.

The inside of the cylinder of a steam engine must receive this bombardment of the water molecules equally on every portion, but the piston only being movable, it is pushed outward and communicates its motion to the crank to which it is attached. It is in this way that molecular motion is converted into mass motion, or into the movement of appreciable masses.

The generation, regulation and practical applications of heat will be considered in the lectures devoted to Pharmaceutical Processes.

MEDICAL BOTANY.*

BY WILLIAM TRELEASE, Sc.D.

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Prior to emergence from its nameless barbaric state, the human race was undoubtedly versed in botany of a strictly practical kind. All omnivorous and vegetable feeding creatures distinguish between wholesome and poisonous plants. Even the butterfly selects the right species on which to deposit its eggs, often from among others that to our eyes are almost identical with it. As our race has advanced in civilization, owing its progress to a more and more rigid division of labor with the attendant and ever increasing specialization by which each piece of the great machine does its work more perfectly, yet more and more completely loses its direct touch with all but a few of the other parts, most men have lost much of what was at first common to all; and this is, perhaps, quite as true of a knowledge of plants as of anything else. As we go from the higher to the more primitive civilization of the present time, we approach by successive steps toward what was at one time characteristic of the entire human race. The country boy has names for most of the plants that the city boy passes by perhaps with a vague notion that they have no names, and he knows abundant uses for many of them. Many is the time that I have hunted sweet cicely and pipsissewa, wintergreen and sarsaparilla in the Connecticut woods; and hoarhound and boneset, yarrow and wormwood are still to be found in the kitchen or the attic of most New England farm houses. In less favored parts of the globe, where the farmer is a peasant, and the peasant often little better than a clodhopper, this sort of knowledge is even more extensive and widespread.

It is said that the mongoose, when bitten by a cobra, runs at once into the jungle and seeks out a plant which it recognizes and eats as an antidote. Whatever the actual knowledge and its value may be, it is certain that every primitive community believes in the healing virtues of many plants and makes use of them for these supposed virtues; and this sort of knowledge was undoubtedly the first that came after the power of discriminating between plants that are edible and those that are not. Among many people considerably removed from the aboriginal state, even to-day, the only conception of a collection of herbarium specimens is that they are for some medicinal use.

Recently in turning to the periodical cases in our library for a reference, my eye fell on a nearly forgotten volume of the Botanic Advocate, published in New Haven in 1843, and on opening it I found it to bear the legend: "The tree of life yielded her fruit every month, and the leaves of the tree were for the healing of the nations." The journal was published by the Connecticut Botanic Society, and I observed that it contained a series of three articles on the subject assigned me, "Medical Botany," the titles of which were "Lobelia Inflata," "Capsicum Annum" and "Myrica Cerifera." Lobelia and calomel were mentioned on nearly every page and appeared in the titles of many of the articles. It is probably unnecessary to say that the journal and the society of which it was the organ were Thompsonian! Independently of the herbalists, however, the botanists of a generation or two ago were physicians, and M.D. to-day is not an uncommon suffix to the name of a botanist, so that the subject assigned to me would seem to be an especially appropriate one for a gathering of medical men.

A very large part of the remedies applied by the physician to-day are of vegetable origin, and this branch of materia medica is an important part of the course of study of a physician. But this, as above said, is the age of specialization; it is the age of druggists and prescription clerks, of triturates and fluid extracts, and of laboratory synthesis. Few, indeed, are the physicians who can make a tincture or an alkaloid salt as well or as cheaply as the druggist or the manufacturing chemist, and, under needful restrictions the latter are turned to by the physician as certain to supply the things needed in a pure and assimilable form, and in any desired proportion. Even water for the physician's use, that was first employed as it came from the well, the cistern or the brook, then boiled before use, and turned over to the druggist for distillation, so that it could be procured in a pure and safe form for critical purposes, is finally coming into the hands of people whose exclusive business is the distillation and purification of water. The materia medica, like one's clothing, is more and more something to be ordered outside rather than a legitimate subject for home manufacture.

And so it has come that the study of medical botany has to-day fallen to the pharmacist to a larger extent than to the medical student. He, indeed, is expected to know his botany well. He need not be a vegetable physiologist or a mycologist, and karyokinesis may possibly be a process of which he never heard, but in certain lines he must be a botanist. As a result, we find studies of this kind omitted from the medical curriculum proper and give place in that branch of medical study which has come to have a name and a place of its own—pharmacy.

Whether taught in the medical school or the school of pharmacy or the school of botany, the knowledge which the collector and the manufacturer of drugs needs is of the most practical and useful character. A knowledge of the affinities of plants will very often lead the manufacturer to experiment with species related to those which yield useful products. You are all familiar with the various cinchonas and their relative quinin-producing properties. But in the main the knowledge which is needed is that which enables one surely to distinguish one certain plant in all its forms from all other plants. Every few years the drug trade is exercised over substitutes offered more or less honestly by collectors and jobbers. It is only a short time since cascara sagrada, the bark of Rhamnus Purshiana, was replaced very considerably by the bark of a related species, Rhamnus Californica, the latter of much inferior quality. It is also only a few years since the trade journals contained an extensive description of the substitution of the roots of Polygala alba for the senega snakeroot, Polygala Senega. Not many years ago, a sample of tansy which was submitted by a large wholesale house proved, probably as the result of a clerical blunder, to be pansy.

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The direct solution of problems of identity like the preceding is the closest link between botany and pharmacy, the most obvious medical botany. It is a branch of the study of vegetable pharmacognosy. The last instance mentioned is a very simple one. The merest tyro could detect the mistake and guess pretty closely at the cause for it; but in the other cases a discrimination between the things to be compared proved decidedly more difficult.

As they come to the wholesaler and the manufacturer, drugs are apt to occur in the form of more or less fragmentary root, rootstock, bark, leaf, flower, fruit and seed. Only rarely, as in the case of opium, are the active principles collected to any great extent freed from the parts of the plant which produces them. Hence, in the great majority of cases, the medical botanist is expected to accurately name certain parts of fairly well-known plants.

It has, unfortunately for this purpose, been the habit of descriptive botanists to aim at as brief a diagnosis of each species as possible, and to use those characters which most surely and most readily serve to separate it from its congeners; or else, as is the case with much modern work, what are felt to be the less variable and consequently the surest and most permanent characters have been taken as the basis of classification, many of the more obvious features being left entirely undescribed. The result is that a person who uses the ordinary manuals of botany, unless he is quite expert as a botanist, requires flowering or fruiting specimens as a preliminary for the determination of their names, and very much of the botany taught in schools and colleges, being based on and preparatory to the use of these manuals, is confined to a study of the characters employed in them.

Medical botany, if well done, must start from a somewhat different standpoint. It by no means follows that a plant which can be determined by aid of the usual manuals only when it is represented by perfect flowering and fruiting material, can not be known with almost or quite as great certainly when neither flowers nor fruit are present. Except in certain genera, like the oaks and plums, the trees and shrubs of our flora may be known with quite as much certainty in the winter when destitute of flower and fruit, and even foliage, as in the summer season; but in the absence of manuals based on their winter characters, this knowledge is possible only as the result of individual observation and investigation, based primarily on a knowledge of the species derived while their summer characters are present; and the same is true, to a greater or less extent, of all of the fragmentary, or as the botanist would call it, imperfect material that passes through the hands of the medical botanist.

The characters which the latter makes most use of are histologic characters. Where sufficiently large fragments of root or rootstock, leaf or fruit or seed occur, these may of course be used, being subject to whatever preparation is necessary to bring them into a condition fit for comparison with either living or preserved authentic specimens; but it is only exceptionally that a superficial comparison is sufficient. Usually the distribution of the woody tissues and ducts and of the bast fibers within the specimen, the occurrence of resin passages, oil cells or latex tubes, the character and the distribution of stomata and palisade cells in the leaf, the occurrence or absence of pubescence and superficial glands, and the structure and grouping of the hairs and the structure of the seed shell have to be looked into. Sometimes, also, it is necessary to test the degree of lignification of certain cell-walls, to determine the nature of secretions, and to examine, both morphologically and chemically, the starch contained in the specimen, which is compared in each of these respects with authentic standards.

Evidently this practical botany of medicines rests upon a more or less intelligent conception of botanic classification, but is itself the application of a special skill. Quite recently a professor of pharmaceutic botany in one of the leading colleges of the country published a laboratory manual which may be held to represent his ideas as to what should be taught in preparation for it. A general knowledge of the parts of the plant, root, stem, leaf, etc., and of each of the principal tissues of the higher plants, is accompanied by a rather thorough examination of several plants of medicinal value or related to medicinal species. As thorough a knowledge as may be of a few plants is sought for, instead of a little knowledge concerning a great many, in the expectation that on this the student will subsequently build an equally thorough knowledge of all of the plants coming within the range of his observation. Not many years since another successful teacher of the same subject laid down the essential thing as being "that the course should be sufficiently comprehensive to equip the student if he desires at its conclusion to pursue further investigation of the study by himself, that is without any assistance other than books such as manuals, class books, floras, etc." To accomplish this he divides his classes into sufficiently small sections to place specimens of each subject taken up in his lectures into the hands of all pupils, keeping before their eyes at all times on the walls of the room, a carefully labeled set of specimens illustrating the same things, and closing his course by an exercise in which a lot of mixed, unnamed material is placed on the lecture table and sorted out by the professor and students, the characters utilized being indicated step by step during this exercise.

Here, if anywhere, object teaching is essential, and each of these courses is taught as a series of object lessons. Gross characters are made out by the aid of the naked eye and simple magnifying glasses, but for others the compound microscope is brought into requisition and some of the pharmaceutic schools have as a part of their curriculum a regular course in microscopy. Unless it be biology, no word is more abused than this; but for our purpose a sufficient working knowledge of the optic and mechanical parts of the microscope and ability to make serviceable temporary and permanent preparations, is treated as of far greater value than the ability to resolve difficult test objects and to run an unimpeachable ring of Brunswick black or shellac. All that is useful in the technique of the zoologist, the botanist and the embryologist, is utilized to get serviceable sections cut with intelligence at a point calculated to show representative structure, and the skill of the chemist is made to yield, under the cover-glass, reactions as characteristic in their way as those obtained in the test-tube or before the blowpipe. Equipped in this way, the student is able to determine those characters afforded by his material which enable him to say with certainty that it is or is not the same as a standard specimen of the thing to be compared with. Primarily he is called on to recognize this identity or difference in comparison with the plant that the material is supposed to represent. If it be different the question as to what it really is is only a secondary one, and as his knowledge increases he becomes more and more able to answer these accessory questions.

A good description is more available for use than a poor specimen, and the time is coming when this, as well as each other branch of technical botany, will be equipped with manuals employing the characters which are available in the class of material that must be studied. Perhaps the progress of American systematic botany has been retarded more by the easily acquired habit of naming new specimens by matching them in the herbarium than in any other way; and the best workers, now that monographs are increasing in number, turn first to a monograph and determine a specimen by the aid of the descriptions before going to the herbarium. But what is a good description to-day may be a very poor description five years from now, owing to the discovery of new material influencing the limitation of species. Hence a specimen is always potentially better than a description, since the former is the thing itself, while the latter is only a more or less subjective interpretation of it, and in medical botany, as in general botany, the herbarium is of prime importance.

The medical or pharmaceutic herbarium should differ from the general herbarium in containing only medicinal plants and their nearest allies. One familiarizes himself with an herbarium of a thousand sheets where he is utterly at sea in a collection of a quarter of a million specimens. The specimens contained in this technical herbarium should be perfect from all points of view—good in the sense of the ordinary botanist as representing the technical characters which he uses in classifying each plant; good from the standpoint of the person who does not know general botany in representing every part of the plant which he may find in a disconnected condition and wish to compare; good from the standpoint of the histologist as affording usable material for sectioning and microchemistry; and good from the standpoint of the investigator in offering abundant material for study and comparison. Where the woods can be turned to by the student the herbarium specimens are easily supplemented when needed by freshly gathered material; but manufacturing pharmacists, like other manufacturers, drift into large cities where this is often inconvenient or impossible. Not long ago it was said in one of the leading druggists' journals that "the pharmaceutic profession more than almost any other, is interested in the proposition to establish a great botanic garden (referring to the then proposed New York garden.) As scientific principles become more and more extensively incorporated into the practice of pharmacy, there is increased recognition of the necessity for a practical acquaintance with the sources of our drugs. This does not of necessity imply an extensive knowledge of theoretic botany, desirable as that is, but a thorough personal acquaintance with medicinal plants is of the greatest value to him who must daily discriminate against substitutions, adulterations, inferior varieties and collections and deteriorated samples. The ideal opportunity for cultivating this acquaintance is in the botanic garden, where we have brought together for immediate comparison the doubtful species under consideration in a living state, and where the characters thus observed can be followed up closely in the herbarium and materia medica collections forming adjuncts to the garden." Besides what can be preserved in the herbarium proper and the garden, the reference collection ought to contain standard material of all drugs in their crude form, so that any changes in appearance which the specimen under study may have undergone during its preparation will be likely to be matched by a corresponding change in the standard; and besides the museum material here referred to, which is most readily utilized by the investigator if kept boxed in immediate connection with the herbarium sheets, a set of histologic preparations ought to be made, representing not only the tissues of each officinal plant from authentic specimens, but also such preparations as can be made from the fragmentary drug, of which good sections are often obtained with difficulty, while the mode of fragmentation is sometimes characteristic.

To-day nearly all students are taught not only to observe, but to record their observations, both in writing and by means of sketches. The medical botanist, perhaps more than most others, is likely to be benefited by forming this habit. A sketch made while the study is fresh in one's mind, somewhat idealized, not by the introduction of fanciful details but by the omission of confusing structures which one sees in all preparations, renders the future examination of a slide much easier and the conclusion drawn from a comparison with it more certain. I should therefore sketch the essentials of every preparation so preserved, and while the matter is fresh in one's mind a brief memorandum is easily written in connection with the sketch, describing differences between related things that may be transient in the slide or liable to be overlooked.

Medical botany, therefore, as a technical study for the manufacturing pharmacist and collector, and to a less extent for the dispensing druggist, but hardly for the medical man, in my mind is really a minute acquaintance with each plant used in medicine, with each of its parts in the form in which they are employed for the extraction of the drug as finally used; and it is properly learned by a course of study limited to very nearly the lines sketched above. Having reached this point, the botanist very properly, if time permits, extends his knowledge of general botany. Before this point, if he know the meaning of a generic and a specific name, of a natural family and a variety, he is enough of a botanist to do his work well.

To the physician of to-day, medical botany, which only a few years ago seemed to be passing from his hands, is returning in twofold form, but it is doubtful if the great majority of physicians are justified in dipping very far into it. Occasionally poisoning by eating cetain toadstools, or roots of a few umbellifers, demands a certain amount of botanic knowledge, but I take it that in practice the suspicion of this poisoning is as practically useful as the actual knowledge of the plant which has caused it. The dermatologist, more than the general physician, is called on to recognize causes for dermal manifestations which he often traces to the use of food of one sort or another, which in some cases the idiosyncrasy of the patient reacts to in rather a marked way, and it is only a few years since a professor in the Harvard Medical School published an exhaustive treatise on the plants which produce such effects. A few plants, like the poison ivy, are very pronounced external irritants. But so far as practical purposes are concerned, the physician needs to know to what to ascribe certain manifestations of this sort, very much as he needs to know the effect of certain drugs, rather than to have a botanic knowledge of the irritant.

With the growing knowledge of bacteria, however, a more directly necessary branch of medical botany seems to be opening up. It is not necessary for the physician to know all bacteria, perhaps hardly necessary to know any large number of pathogenic species; but tubercle, leprosy, cholera, and certain other diseases of frequent occurrence, are so clearly marked by the occurrence of bacteria in or about the diseased tissues, that a diagnosis is often made with certainty only after a bacteriologic examination has been made. The Widal test for typhoid fever now has come into general use, and in the case of cholera and diphtheria it is, I believe, generally recognized that an easily made pure culture of bacteria from the patient affords the surest and quickest information as to the positive occurrence of the disease.

To-day I suppose that there is not a good medical school in the country which has not a well equipped bacteriologic laboratory. The teaching needed for this branch of medical botany, like that needed for the older medical botany, which is now more properly regarded as pharmaceutic botany, ought to be of the most directly practical kind. A knowledge of methods first and of facts afterward is what is demanded. Some bacteria, the ordinary aerobic species, are so easily isolated and grown in pure cultures that the means of doing this ought to be at the hand of every physician, though I observe that certain boards of health are now undertaking to supply the apparatus and culture media needed for diphtheria work, so as to reduce the practitioner's part to the minimum of manual manipulation. The preparation and examination of slides offers little difficulty to the medical student who is already equipped with a knowledge of

The Era Course in Pharmacy.

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JUNIOR COURSE. LECTURE No. 11.

Inorganic Chemistry.

The Halogens.—*Concluded.* The Oxygen Group.

Compounds of Iodin.

Iodin forms one compound with hydrogen, Hydriodic Acid, HI, and two oxygen acids, Iodic and Periodic.

Hydriodic Acid, HI.—Hydriodic Acid is a heavy, colorless gas, fuming in moist air, and resembling hydrochloric and hydrobromic acids in many of its properties. It may be prepared in solution like hydrobromic acid by the reducing action of phosphorus or of hydrogen sulfid upon iodin in the presence of water, the gaseous acid being very soluble in that liquid.

The iodids of the metals are generally soluble, except those of silver, mercury and lead, the latter being sparingly soluble. Iodin is released from iodids by the same oxidizing agents as are used to set free chlorin and bromin from their chlorids and bromids.

The iodids are used in medicine as alteratives, and are largely consumed in photography and in the arts. They are identified by setting free their iodin by means of an oxidizing agent, and testing the released element with carbon disulfid or starch paste.

Iodin and Oxygen.—Only one oxid of iodin, the pentoxid, I_2O_5, is certainly known to exist. This is the anhydrid of iodic acid, HIO_3, which it yields when dissolved in water.

$$I_2O_5 + H_2O = 2HIO_3.$$

Iodin when dissolved in alkali yields a mixture of iodid and iodate, as follows:

$$6I + 6KOH = KIO_3 + 5KI + 3H_2O.$$

Iodic acid can be obtained from the iodate by decomposing the latter with an acid. The pure acid is in the form of colorless, rhombic crystals, which on heating decompose again into the anhydrid and water.

$$2HIO_3 \text{ (heated)} = I_2O_5 + H_2O.$$

Iodates may be further oxidized to Periodates, as KIO_4, the salts of an acid corresponding to an hypothetical anhydrid, I_2O_7, in which iodin is septivalent. The iodates in general resemble the corresponding chlorin and bromin compounds.

Iodin when present in any of its oxygen compounds is detected by being first released by reducing agents, such as SO_2 or H_2S, and testing in the usual manner, with carbon disulfid or starch paste.

COMPARISON OF THE HALOGENS.

The student will not have failed to notice the parallelism of properties exhibited by the members of this group. For example, all are very active elements, and on this account are rarely, if ever, found in nature in the free state. All are strong oxidizing agents, and destroy the colors of many organic compounds. Each forms a single gaseous acid, the molecule of which contains one atom of hydrogen and one of the halogen. The salts of these acids, the fluorids, chlorids, bromids and iodids, and the salts of their corresponding oxygen acids have many properties in common.

In addition to this parallelism we may also notice a remarkable *progression*, or step by step modification of properties in passing from either end of the series to the other, corresponding to the variation in their atomic weights, which are: F., 18.91; Cl., 35.18; Br., 79.34; I., 125.89.

(1). There is a progressive increase in density, the first being a gas but little heavier than air, the second a gas more than twice as heavy as air, the third a liquid nearly three times as heavy as water, and the last a solid more than four times as heavy as water.

(2). There is a corresponding deepening of color, fluorin being nearly colorless, chlorin greenish-yellow, bromin orange red and iodin almost black.

(3). There is a reverse progression in chemical activity from the first to the last, fluorin being the most active and iodin the least active of the family. Bromin can displace iodin from its compounds, chlorin can displace bromin, while fluorin can displace all three.

(4). There is a similar reverse progression in their affinity for hydrogen. Fluorin can combine with hydrogen either in the light or in the dark, and decomposes water explosively to obtain that element. Chlorin can combine with hydrogen in the presence of light only, and decomposes water slowly. Bromin will not combine directly with hydrogen, even in the light, unless with aid of the electric spark, and decomposes water only when exposed to bright sunlight. Iodin can be made to combine with hydrogen directly only with difficulty, and does not decompose water even in sunlight.

(5). There is a decrease in non-metallic properties from the first to the last, fluorin being the most decided of non-metals, while iodin has a metallic luster, and exhibits some marked basic properties.

Many other features of parallelism and progression might be pointed out, but the examples given are sufficient to show the remarkable relation existing between the properties of these elements and their atomic weights.

THE OXYGEN GROUP.

Oxygen. Sulfur. Selenium. Tellurium.

Like the halogens, these four elements exhibit a strongly marked group relationship, and a similar progression in physical characters and chemical properties. Like the halogens, also, the first member of the oxygen group is the most active chemically, and the most distinctly non-metallic in character, while the last member is in many respects the least active, and exhibits qualities of a metallic character.

OXYGEN.

Symbol, O. Valence, 2. Atomic Weight, 15.88.

Historical.—Oxygen was discovered August 1, 1774, by Joseph Priestley, who obtained it by decomposing red mercuric oxid with the aid of a burning glass. Its name, derived from the Greek *oxus*, sour, and *gennao*, I produce, means literally generator of acids, and was given to it by Lavoisier, because of the acid nature of many of its compounds.

Natural Sources.—Oxygen is the most abundant and most universally distributed element on the earth. It constitutes about 20 per cent. of the atmosphere, over 85 per cent. of the ocean, and from 44 to 48 per cent. of the compounds which compose the solid portions of the earth's crust, or, altogether, about 50 per cent. of the entire matter of the globe. In combination with two or more other elements it is found in a vast number of substances. Nearly every compound familiar to every-day life contains it. The petroleum compounds are perhaps the most notable examples of non-oxygen-containing substances.

Of the terrestrial atmosphere, about one-fifth consists of free or uncombined oxygen, the other four-fifths consisting mainly of nitrogen, with smaller quantities of carbon dioxid, water vapor, argon and various other gaseous substances. So far as animal life is concerned, the oxygen is the essential constituent of the air, the other gases acting merely as diluents.

Preparation.—Oxygen may be obtained by a number of processes, but is more commonly prepared by the heating of compounds rich in the element to their points of dissociation, such as the easily decomposable oxids, permanganates, nitrates, chlorates, chromates, etc. Only a few of these methods need be described.

(1). By heating mercuric oxid, which decomposes into oxygen and mercury. This method is costly and of historical interest only, being the process made use of by Priestley when he discovered the element.

$$HgO\ (\text{heated}) = Hg+O.$$

(2). By heating potassium chlorate, either alone or with manganese dioxid, the process commonly used in the production of oxygen on the small scale. (Fig. 22). The decomposition takes place in two steps. The chlorate is first broken up into chlorid, perchlorate and oxygen, and as the heat is increased, the perchlorate decomposes into chlorid and releases the remainder of the oxygen.

$$2KClO_3+MnO_2\ (\text{heated}) = KCl+KClO_4+O_2+MnO_2.$$

$$KClO_4+MnO_2 = KCl+2O_2+MnO_2.$$

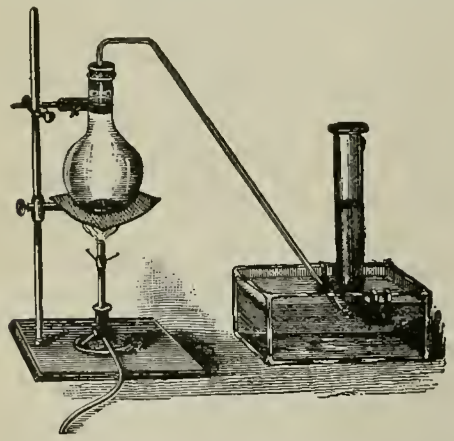

Fig. 22.—Oxygen from Potassium Chlorate and Manganese Dioxid.

The manganese dioxid, without being itself decomposed or entering into combination, causes the oxygen to be released at a lower temperature than would otherwise be necessary. This is an example of what is known as *catalytic* action, or where one substance by its mere presence causes or facilitates a chemical change in some other substance without being itself affected.

It is highly important that the manganese dioxid used should be free from organic matter, otherwise explosions are liable to occur which may be dangerous if large amounts are employed.

(3). Brin's Process. This is one of the processes made use of in the production of oxygen on the commercial scale, and is based upon the ability of barium oxid to take up oxygen when heated in contact with air under pressure, and to give it out again when the pressure is reduced.

Barium oxid in the form of a porous mass is heated in iron cylinders in contact with air, which has been freed from carbon dioxid, at a pressure of about two atmospheres. Under such circumstances oxygen is taken up and the dioxid formed.

$$BaO+O = BaO_2.$$

The pressure is next reduced to about 14 pounds less than one atmosphere, when the dioxid decomposes into the monoxid and oxygen.

$$BaO_2 = BaO+O.$$

The gas is then compressed and stored in the iron or steel cylinders in which it is transported.

(4). Another commercial process is based upon the differing solubilities of oxygen and nitrogen in water when subjected to pressure. When pressure is applied to air contained over water, the latter dissolves more oxygen than nitrogen. If now the dissolved air be permitted to escape, it will be richer in oxygen than before solution. By repeating the solution often enough, the residual nitrogen is at length reduced to an insignificant amount.

Physical Characters.—When pure, oxygen is an odorless, colorless and tasteless gas, condensible at a pressure of 50 atmospheres, and —118° C. to a transparent liquid, lighter than water, and paramagnetic. The gas is slightly soluble in water, 100 volumes of the latter dissolving 4.1 volumes, the solubility increasing with the pressure.

Chemical Properties.—Oxygen can be made to combine either directly or indirectly with nearly every known element. With all the metallic elements it unites directly, except in the case of the so-called "noble metals," as silver, gold and platinum. The oxids of these can, however, be produced by precipitating them from solutions of their salts. With fluorin it does not combine either directly or indirectly. With the remaining halogens, it can be made to combine only in the presence of a third element.

When elements combine with such rapidity that sufficient heat is evolved to render one or more of the substances present luminous, the process is termed combustion, and since the combination of many substances with oxygen is attended by the production of light and heat, oxygen is commonly said to be a "supporter of combustion," and one of the most striking properties of pure oxygen or of an atmosphere rich in that substance is the readiness with which it supports the combustion of materials ordinarily incombustible in the air. Iron in the form of wire, and many other metals, when raised to a red heat and plunged into a vessel of oxygen, take fire and burn with great brilliancy. (Fig. 23).

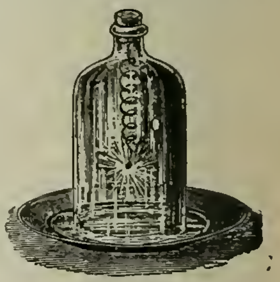

Fig. 23.—Watch Spring Burning in Oxygen.

If, however, a stream of air or oxygen be conducted into a tank of coal gas and ignited, it will burn similarly to a jet of the coal gas when the latter is ignited in the air, the zone of combustion being simply the region where the activity of combination is great enough to raise some of the particles concerned to incandescence. It is thus seen that the terms "combustible" and "supporter of combustion" are convertible, depending merely upon which substance forms the atmosphere surrounding the place of combination.

When the combination with oxygen is so slow that the temperature is not greatly raised above the normal temperature of the air, the process is termed slow oxidation. The decay and fermentation of organic substances are examples of slow oxidation.

Uses.—The most common special use of oxygen is in the production of the oxyhydrogen flame. To produce this a stream of oxygen is led through a burner of special construction into the center of a burning jet of hydrogen or coal gas, the result being a nearly colorless flame of intensely high temperature. (Fig. 24). The flame may be employed for the melting of refractory metals, or for the production of the "lime light" used in stereopticons, made by directing the stream of burning gas against a stick of lime, which is thereby heated to a state of dazzling incandescence.

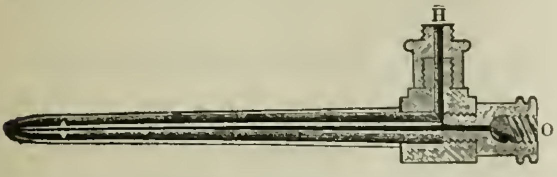

Fig. 24.—Oxyhydrogen Blowpipe.

OZONE.

The formula for the oxygen molecule is O_2, signifying that it consists of two atoms. By passing an electric discharge through a vessel containing oxygen, and by several other methods it can be made to combine in molecules of three atoms each, or O_3, and in this state is known as Ozone. It exists in the atmosphere to some extent, and is more abundant in the air after thunder storms, and in country districts than in cities. The peculiar, penetrating odor noticed in the neighborhood of electrical machines while in operation is due to ozone. It is also produced in small quantities by the slow oxidation of phosphorus in moist air.

That ozone is simply a condensed form of oxygen is apparent from the equation:

$$3O_2 = 2O_3.$$

Owing to the readiness with which the third atom is given off, ozone presents the oxidizing effects of ordinary oxygen in an intensified degree. Substances perfectly stable in the presence of ordinary oxygen are quickly oxidized and decomposed by ozone. It attacks and quickly tarnishes mercury and silver by forming a coating of oxid on the surface. Its property of setting free iodin from iodids is made use of as a test.

Ozone is an instance of *allotropism*, or the ability of an element to exist in different forms with different sets of properties, which are sometimes so greatly dissimilar that they might be taken for different elements were it not that one form can be converted into the other. Allotropic modifications are probably due to variation in the arrangement of atoms in the molecule, as in the present example.

PRACTICAL STUDIES.

1. In a test tube place about 0.5 Gm. of red phosphorus, add about 10 Cc. of water and a small portion of powdered iodin. If reaction does not take place, *warm gently.* Pour or filter off the clear solution and test it for hydriodic acid as follows:

2. Add a small portion to a dilute solution of silver nitrate, lead acetate and mercurous nitrate, contained in different tubes. Note the results and write equations to represent the reactions.

3. To the remaining portion of the solution add a few drops of strong nitric acid. If the solution becomes colored, divide into two portions. To one portion add carbon disulfid or chlorform, and agitate, as in the third experiment.

Add a few drops of the second portion to a tube filled with water and containing a few drops of starch paste, and note the result.

4. In a dry flask or test tube, place 5 or 10 grams of potassium chlorate in crystals, mixed with manganese dioxid, and heat in a bunsen burner or alcohol lamp flame. (Fig. 25). By means of a delivery tube collect several larger tubes full of the gas by displacement of water. Leave the tubes of gas mouth downward in the water of the pneumatic trough until wanted for use.

5. Into one of the tubes held mouth upward, insert a pine splinter, the end of which is a glowing coal. What occurs?

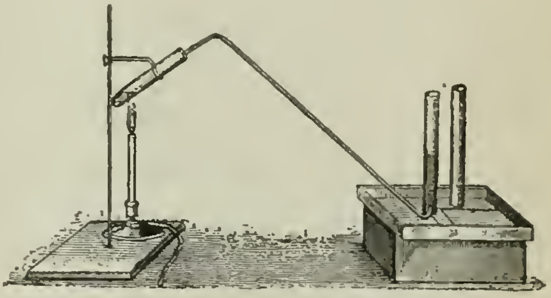

Fig. 25.—Student's Oxygen Generator.

6. Tip a straightened piece of watch spring, about 15 cM. long, with sulfur. Ignite the sulfur and hold it in the oxygen contained in another tube. If the conditions are properly observed and sufficient oxygen is present, the watch spring will burn with a shower of brilliant sparks. The sparks given off, if collected, will be found to be magnetic. They are in fact magnetic oxid of iron, Fe_3O_4.

Instead of collecting the gas in tubes, the splinter bearing the live coal and the watch spring may be held directly in the tube in which the oxygen is being released, but in this case it will be found harder tocause the ignition of the spring because of the diluting effect of the air which is present.

7. In the bottom of a jar place a piece of yellow phosphorus the size of a grain of Indian corn. (Do not handle the phosphorus with the fingers). Partially cover the phosphorus with water to prevent its ignition, cover the jar loosely and set aside for eight or ten hours. At the end of that time hold in the jar a strip of paper coated with starch paste and a solution of potassium iodid. What change takes place in the color of the paper, and what does it indicate as to the gaseous contents of the jar?

JUNIOR COURSE, LECTURE No. 14.

Pharmaceutical Physics.

The Mechanical Powers. Sound.

Wheel and Axle.—As may be observed from the figure, the wheel and axle is a continuous form of lever of the first order. (Fig. 38). If a hoop be fastened over the two ends of a lever of this order, the result is a wheel; or if from a wheel there are taken away the rim and all the spokes but two on opposite sides, there will be left a lever.

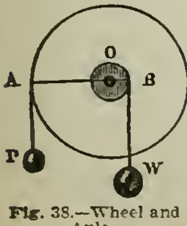

Fig. 38.—Wheel and Axle.

In the wheel and axle, the distance from the *rim* to the pivot upon which it turns is the force-arm, and from the *surface of the axle* to the pivot, the load-arm. In practice the wheel is often replaced by a crank.

Since the wheel and axle is a form of lever, the same law will apply, and may be expressed as follows: *The product of the force by the radius of the wheel will be equal to the product of the load by the radius of the axle.*

As in the lever, what is gained in power is lost in speed. The distance through which the rim of the wheel passes must be as much greater than that through which the circumference of the axle passes, as the load is greater than the force.

The Train of Wheels.—Like the lever, the wheel and axle may also be compounded, forming the Train of Wheels. (Fig. 39). In this, as shown by the figure, the peripheries are set with cogs, the teeth on the axle of one engaging with the teeth on the next wheel, and so on. The result is that the mechanical advantage of one is transmitted to the next.

In the train of wheels, the force applied multiplied by the continuous product of the radii of the wheels is equal to the load multiplied by the continuous product of the radii of the axles.

Inclined Plane and Wedge.—The Inclined Plane is sufficiently defined by the name—a "plane" or level surface, "inclined," or placed at an angle to the horizontal. (Fig. 40).

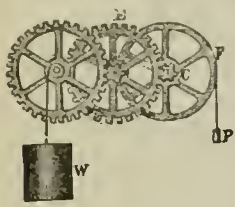

Fig. 39.—Train of Wheels.

The *gradient* is the ratio of the vertical rise to the length of the incline 2.5 M., the grarise be 0.5 M., and the length of the incline 2.5 M., the gradient will be $0.5 : 2.5 = \frac{1}{5}$.

On an inclined plane, a force parallel with the surface will support a load as many times greater than itself, as the length of the plane is greater than its height, or the *force equals the load multiplied by the gradient.* The result is best shown by an example.

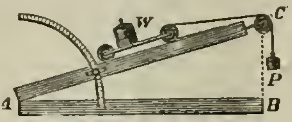

Fig. 40.—Inclined Plane.

If a plank three meters in length extend from the ground to a wagon one meter high, what power, neglecting friction, will be required to balance upon it a barrel weighing 150 KGm? The gradient is $3 : 9 = \frac{1}{3}$ The load is 150 KGm. Multiplying the load by the gradient, $150 \times \frac{1}{3} = 50$ KGm, the power necessary to sustain the barrel.

The Wedge is a movable inclined plane which is forced against or under the load, instead of being moved over it. (Fig. 41).

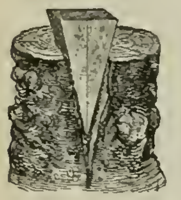
Fig. 41.—Wedge.

The wedge may be either single or double, and is operated by percussion.

The Screw is an inclined plane turned around a cylinder, and has the same relation to the inclined plane just described that a spiral staircase does to a straight one. Except in the taper screws of the carpenter, a nut is used through which the screw works. (Fig. 42).

The *Pitch* of a screw is the vertical distance between the centers of two contiguous threads, or it is the vertical distance through which the screw passes in making one complete revolution. If the pitch is $\frac{1}{20}$ it means that there are 20 threads to the inch, or that the screw makes 20 complete turns in passing through a space of one inch. It will be seen, therefore, that pitch is another name for gradient.

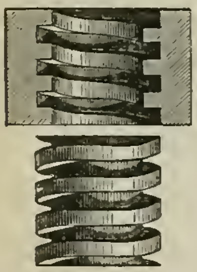
Fig. 42.—Screw and Nut.

As the screw is a form of the inclined plane, the same law applies to both, or the *force equals the load multiplied by the pitch.*

The screw is frequently turned by means of a lever or wheel attached to the upper end. When either of these is added, the combination becomes a compound machine. In consequence of the great distance through which the force applied must pass, as compared with the space through which the screw advances, this machine is a means by which immense power can be exerted, though only for a short distance.

The Pulley.—The Pulley is a wheel, grooved to carry a rope, and turning on an axle. (Fig. 43). As the end of the rope to which the force is applied moves downward, the end bearing the load moves upward.

With a single fixed pulley, the force travels as far as the load is lifted, the only advantage being a change of direction in the application of a force.

By means of a movable pulley, there may be a gain in force as well as the advantage of a change of direction.

For example, if the pulley to which the load is attached be movable, then for each cM. the load rises the rope must travel 2 cM., and, according to the general law of machines, the load which can be lifted by the force will be doubled. If another pulley be introduced into the system, so as to give three lines of rope acting on the load, then for each cM. the load ascends the rope must move 3 cM., and the effect of the force is increased three times. (Fig. 44). In general, the increase in the load which can be lifted with a given force will be proportional to the number of lines of rope between the fixed pulley and the movable pulley supporting the load, while the distance passed over by the load will be in inverse proportion.

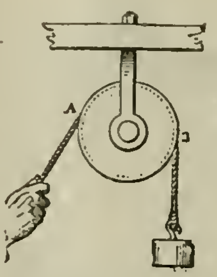

Fig. 43.—Fixed Pulley.

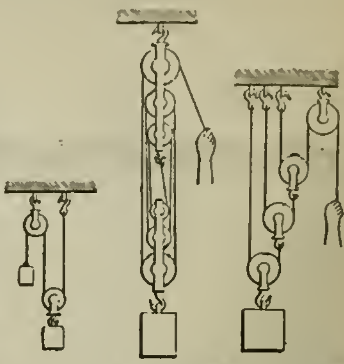
Fig. 44.—Fixed and Movable Pulleys.

When several pulleys are fastened together in one framework, the combination is known as a *block*, and the individual pulleys as *sheaves*.

PHARMACEUTICAL APPLICATIONS.

The Drug Mill.—Probably the most useful application of the wheel and axle to pharmacy is in the construction of the common drug mill.

While the particular pattern may vary greatly, the principle of the machine is that of a large wheel (or crank), attached directly, or by a train of gear wheels, to a grinding surface borne on the axle. The force applied to the circumference of the wheel or to the handle of the crank is the power, and the resistance of the drug is the load. Neglecting friction, the product of the power by the radius of the wheel will be equal to the product of the resistance by the radius of the grinding surface.

The Wedge is capable of some pharmaceutical use as a means of expression in the so-called "wedge press." In this the substance to be expressed, contained in suitable press cloth, is placed between smooth surfaces which are forced together by driving in wedges with mauls. An application of the inclined plane is seen in the use of planks to aid in the removal of a barrel from the cellar, etc. The direct lift may be quite beyond the power of the operator, but by rolling it up the slant, an exchange of distance for power is effected.

The Screw is applied to pharmaceutical purposes in the construction of the various styles of the screw Tincture Press.

If the screw has a pitch of 0.5 cM., and the lever a length of 0.5 M., what will be the gain in power of a force applied to the lever?

Since the circumference of a circle is equal to the radius multiplied by 3.14, in one complete turn the end of the lever would pass through $0.5 \times 3.14 = 1.57$ M., while the end of the screw would advance only 0.005 M. The force would, therefore, advance through a space 314 times as great as the load, and would consequently be multiplied by 314, or a force of 10 KGm. at the lever would produce, neglecting friction, a thrust of 3140 KGm. at the point of the screw.

SOUND.

While the phenomena of sound may not be very closely associated with pharmaceutical operations, some knowledge of the science should be possessed by every intelligent person, and therefore no apology is offered for presenting a brief review of the fundamental principles of the science at this place.

Sound and Sound Sensation.—Commonly the term sound is used to designate both a peculiar sensation and the physical cause of that sensation. However these two meanings may be confused in common conversation, they must be carefully distinguished in scientific discussion.

The sensation of sound is purely physiological and subjective, and has no existence outside of the brain of the sensitive subject; the cause of that sensation is external and objective, and exists independent of either ear or brain.

The brief discussion which follows will be confined mainly to a consideration of sound in its objective sense, or to the physical agency which gives rise to the sensation.

Definition of Sound.—A sound traced to its source will always be found to originate in a vibrating body, or a body which in whole or in part is in a state of rapid motion to and fro. When the vibration ceases, the sensation of sound also ceases.

Investigation also shows that there is always a medium between the vibrating body and the ear of the sensitive subject, and that this intervening medium is set in vibration by the sound producing object, and reproduces these vibrations upon the ear. A sound therefore consists of mass vibration, capable of transmission to the ear and of producing a sound sensation.

Nature of a Sound Wave.—It is ascertained by experiment that when a medium is in the act of transmitting sound vibration, its parts are alternately in a state of condensation and rarefaction. Conceiving the vibration to originate at any particular point, it advances outward in all directions in a sphere, or series of spheres, a zone of rarefaction succeeding one of condensation, the spheres growing larger as they recede from the point of origin. A condensation and rarefaction taken together constitute a sound wave. (Fig. 45).

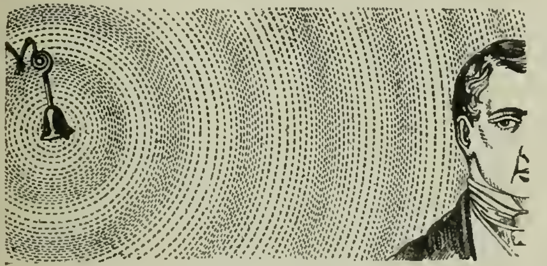

Fig. 45.—Illustrating Sound Waves.

Propagation and Velocity of Sound.—That sound requires an appreciable time to travel through space is evident from observing the time which elapses between the escape of steam from the whistle of a distant locomotive and the arrival of the sound at the station of the observer.

The velocity of sound propagation varies with the nature of the medium through which it travels, increasing with the elasticity and decreasing with the density, or, as expressed in the law, *the velocity of sound varies directly as the square root of the elasticity and inversely as the square root of the density.*

In free air at 0° C., the velocity of sound is 332.4 M. per second. Rise of temperature increases elasticity and decreases density, and consequently increases the velocity of sound propagation at a rate amounting to .608 M. for each rise of 1° C. in temperature. Thus, if the temperature of the air be 16° C., the velocity will be $332.4+0.608\times16 = 342.02$ M.

The knowledge of the velocity of sound enables us to determine approximately the distance of a sounding object, as a cannon, by observing the time between the flash and the arrival of the sound. If this be five seconds and the temperature 16° C., then the gun must be $342.02 \times 5= 1710.10$ M. distant, since this would be the distance sound would travel in that time.

When both the elasticity and density of a medium vary together and in the same ratio, the velocity of sound waves is not affected by the change.

On account of their greater incompressibility and consequent greater elasticity, sound waves travel faster in liquids and solids than in gases, notwithstanding their greater densities. Thus, in water, the velocity of sound is about four times, and in glass and iron about sixteen times, as great as in air. This explains why, if the ear be held near the iron of a railroad, and the iron be struck some distance away, two sounds will be heard, the first through the iron, and the second somewhat later through the air.

Reflection of Sound Waves.—That sound waves may be reflected is familiar to every one who has listened to an echo. Not only may walls and hills reflect sound, but bodies of timber, the wind, clouds, fogs, etc. This fact has an important bearing upon fog signals at sea. A body of fog or a current of vapor may reflect the sound of a bell or whistle so that it may pass clear over a given area on the water, while clearly heard farther out.

The distance of objects may also be approximately determined by noting the time between the shout and the return of the echo. For example, if, in zero weather, the echo should return in one second after the sound, then the wall or object is 166.2 M. distant, since in passing to the wall and back again the sound waves would have traveled 332.4 M., which is the velocity of sound at 0° C.

In order that the echo shall be distinct, the reflecting surface should be so distant that the return sound should not follow closer than within about one-fifth of a second after the original sound, otherwise the sound will be indistinct or blurred, an effect sometimes noticed in speaking in a vacant audience room. This results from the fact that the ear has difficulty in separating sounds which arrive more rapidly than five per second.

The reflection of sound may be shown by placing two concave mirrors facing each other, and some distance apart, and suspending a watch in the focus of one, when by means of a funnel or curved tube, the sound of the ticking may be heard at the focus of the other mirror, though inaudible at intermediate points. (Fig. 46).

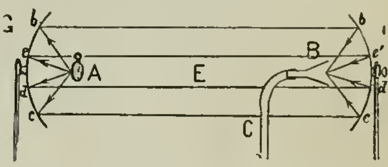

Fig. 46.—Reflection of Sound Waves.

The so-called whispering galleries are rooms whose curved walls act like the concave mirrors, so that persons at opposite sides may hold whispered conversation without being heard by those who are stationed between.

Refraction and Diffraction of Sound.—By the Refraction of sound is meant the change in direction caused by the entrance into or passing through a medium of different density. If between a source of sound, as a watch, and the ear there be interposed a thin balloon filled with some dense gas, as carbon dioxid, the sphere of gas will operate as a double-convex lens and cause the sound waves to converge to a focus on the opposite side, where they will be heard more distinctly than at intervening points, the curvature of the waves being reversed in their passage through the denser gas. (Fig. 47).

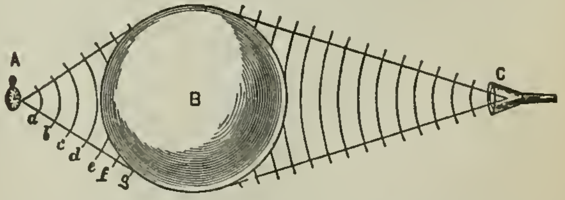

Fig. 47.—Refraction of Sound Waves.

When sound waves strike the edge of an obstacle, secondary waves are set up which pass behind the object, so that the latter only partially forms a "sound shadow."

This bending of the waves around a corner is called *Diffraction.*

Difference in Sound Sensations.—Sound sensations differ in *Loudness, Pitch* and *Quality.*

Loudness, or intensity, depends upon amplitude of vibration, or the distance the air particles in a sound wave swing on each side of a middle line. Since the amplitude or length of swing depends upon the energy of the sound vibration, loudness may be said to depend upon the energy of the sound wave. The more energy the latter possesses, the harder the impact it makes upon the organ of hearing, and hence the stronger the sensation. And as the sound wave gives up its energy to the medium through which it passes, the greater the energy which it possesses at the start the farther it will travel.

Effect of Distance on Loudness.—As previously stated, sound waves advance in the form of a sphere which continually grows larger as the point of origin is receded from, consequently the intensity of the sound must continually diminish. Since the surface of a sphere varies as the square of its radius, (i. e., that doubling the radius increases the surface of the sphere four times). It follows that doubling the distance from the origin of a sound must diminish its loudness to one-fourth, because the same volume of sound is now spread over four times the area, or, as the law is commonly expressed, *Loudness, or intensity, varies inversely as the square of the distance.* Increasing the distance three times would diminish the loudness to one-ninth, since the sound would now be distributed over nine times the surface, etc.

The preceding is known as the Law of Inverse Squares, and applies in all cases where either matter or energy is distributed from a center in the form of a sphere.

Re-enforcement, Consonance and Resonance.—Loudness also depends upon the mass of air which is thrown into vibration. If a tuning fork held in the hand, or a string tightly stretched from the ceiling, be set in vibration, the resulting sound is audible only when the ear is close by the vibrating body. If the stem of the fork be touched to a table or held against an empty box, the object touched will give out a loud sound, corresponding to the note of the fork, or if the string be fastened to a board or across a box, a loud sound will also be heard. The fork or string is itself unable to set sufficient air in vibration to strongly affect the ear, but is capable of communicating its vibrations to the table or box, which in turn sets a larger mass of air in vibration. This re-enforcement of the sound is known as *consonance,* or when the re-enforcing body is tuned in unison with the sounding body, as *resonance.*

The hollow bodies of guitars and violins and the frame upon which piano wires are strung are for the purpose of acting as "sounding boards" or resonators.

PRACTICAL STUDIES.

(1) Take apart a drug mill, and trace its connection with the wheel and axle.

(2) Trace the connection between the inclined plane and screw in the following manner: Cut a strip of paper into the shape of a right angled triangle, so that its longest side represents an inclined plane. Beginning at the base, wrap the paper around a lead pencil, so that its upper edge forms a spiral, when its relation to the inclined plane becomes apparent.

(3) Examine a tincture press. Count the number of threads to the cM. Measure the length of the lever or the diameter of the wheel at the top. Neglecting friction, how many KGm. pressure will be produced by the application of 10 KGm. to the lever?

(4) Prove that sounding objects are in vibration by touching with the finger the side of a bell, tumbler, mortar or other object which has been struck with a hard object. What is the effect of stopping the vibration?

(5) Suspend a watch by a string and note how far it can be heard through air. Next lay the watch on a counter and note how far it can be heard by placing the ear close to the surface upon which it lies. Try other surfaces, as a glass show case, etc. Which is the best conductor?

(6) Fasten one end of a smooth, stout string about 1 M. long to a nail or hook in a wall; stretch it tightly with one hand, and set the string in vibration by plucking it with the other hand. Note the loudness of the sound. Next fasten the string across the open side of a large box and again set it in vibration. How is the loudness affected?

SENIOR COURSE. LECTURE No. 13.

Official Preparations.

Mixtures and Emulsions.

MISTURÆ. The Mixtures.

Ordinarily the term mixture has a very wide significance, being applied indiscriminately to every species of combination of which a definite chemical composition can not be predicated. In this sense it would comprehend a majority of the preparations, both dry and liquid, dispensed by the pharmacist. As the name of a class of official preparations, however, it has a narrower signification. Within the meaning of the Pharmacopœia, *a mixture is a liquid preparation consisting of a solid, not an oil or resin, in the form of a powder, suspended in water by means of gum or sugar, or both.* In the Pharmacopœia of 1880, the class Misturæ included also those in which the suspended solids were resins or oils, but in the revision of 1890 the latter were more properly transferred to the Emulsions. Likewise the long known and used Basham's Mixture, but which does not contain a suspended solid, has been placed with the Solutions.

In the case of mixtures which contain powdered solids, the suspension of the solid is only temporary, depending upon the degree of viscidity of the liquid. For this reason it is proper to dispense them with a shake label attached.

As would be expected from their composition, the mixtures as a rule are not permanent preparations, and should not be prepared in larger quantities than can be disposed of in a short time.

Four mixtures are official in the present Pharmacopœia.

Mistura Cretæ. Chalk Mixture.—Made by triturating 200 Gm. Compound Chalk Powder with 400 Cc. Cinnamon Water, and sufficient Water gradually added to make 1,000 Cc.

The active ingredient of this preparation is prepared chalk, contained in the Compound Chalk Powder, which also provides the necessary gum and sugar to hold the insoluble powder in suspension.

This mixture quickly sours in hot weather, and is better freshly prepared when dispensed.

Used largely as an antacid mixture for children. Dose, 15 Cc.

Mistura Ferri Composita. Compound Iron Mixture.—This combination, also known as Griffith's Mixture, is prepared by rubbing together in a mortar 8 Gm. Potassium Carbonate and 18 Gm. each of Sugar and Myrrh, in small pieces, with 700 Cc. Rose Water, gradually added, until a uniform mixture results. To this is added 60 Cc. Spirit of Lavender and a solution of 8 Gm. Ferrous Sulfate in 50 Cc. Rose Water. Sufficient Rose Water is then added to make 1,000 Cc., and the whole mixed thoroughly together. To be freshly made when required.

The active ingredient is Ferrous Carbonate, produced by the reaction between the Ferrous Sulfate and Potassium Carbonate when brought together in solution.

$$FeSO_4+K_2CO_3 = FeCO_3+K_2SO_4.$$

The remaining ingredients are for the purpose of modifying the flavor of the mixture, to aid in suspending the insoluble substances, and to retard the oxidation of the ferrous compound.

Ferrous Carbonate is an instable compound, quickly changing to ferric oxid, which explains the necessity of freshly preparing the mixture when wanted.

Griffith's Mixture possesses the well-known tonic properties of Myrrh and Iron, the latter of which is presumed to be peculiarly assimilable when in the condition of ferrous carbonate. Dose, 30 to 60 Cc.

Mistura Glycyrrhizæ Composita. Compound Mixture of Glycyrrhiza.—Prepared by dissolving 30 Gm. Pure Extract of Glycyrrhiza in 500 Cc. of Water and adding to a mixture of 50 Cc. Syrup, 100 Cc. Mucilage of Acacia, 120 Cc. Camphorated Tincture of Opium, 60 Cc. Wine of Antimony, 30 Cc. Spirit of Nitrous Ether, and sufficient water to make 1,000 Cc., and the whole mixed thoroughly together. This preparation has long been known and used under the name of "Brown Mixture," probably in allusion to its color. It combines the demulcent qualities of Acacia and Glycyrrhiza with the expectorant and sedative effects of the other ingredients.

The dose for an adult is 15 to 30 Cc., for a child one-quarter to one-half that amount.

Mistura Rhei et Sodæ. Mixture of Rhubarb and Soda.—Dissolve 35 Gm. Sodium Bicarbonate in 400 Cc. of Water, and add 15 Cc. Fluid Extract of Rhubarb, 3 Cc. Fluid Extract of Ipecac, 35 Cc. of Glycyrrhiza and 35 Cc. Spirit of Peppermint. Lastly, enough water is added to bring the measure to 1,000 Cc.

Used as a stomachic, antacid and carminative for children. Dose, 2 to 4 Cc.

EMULSA. The Emulsions

Emulsions are liquid preparations of finely divided oily or resinous substances, or both, suspended in an aqueous menstruum by means of gum or mucilaginous substances. Emulsions are opaque, and usually milky-looking liquids.

The minute droplets of oil or resin are prevented from coalescing by being surrounded by an enveloping coat of the viscid solution of gum. The perfection and permanence of an emulsion depend mainly upon the fineness of the droplets, and the viscidity of the coating.

Emulsions are to be carefully distinguished from the milk-like mixtures made by adding alkaline substances, as Liquor Potassæ and Aqua Ammoniæ to oils or resinous substances. Such mixtures are *soaps* instead of emulsions. If an excess of oil be present, however, it may be emulsified by the soap at first formed.

Milk is an example of a natural emulsion. In this case the globules of butter fat are surrounded and kept apart by envelopes of casein. Other examples of natural emulsions are found in the milky juices of certain plants.

The more common emulsifying agents are Acacia, Tragacanth, Dextrin, Starch, Yolk of Egg, Condensed Milk and Mucilage of Irish Moss. The viscidity of the menstruum is frequently increased by sugar, and flavoring agents are often added. In the official emulsions, the emulsifying agent is either naturally contained in the substance to be emulsified or is prescribed by the Pharmacopœia.

In extemporaneous emulsions, when the emulsifying agent is not fixed by the prescriber, the pharmacist usually exercises his discretion in the selection of a suitable substance. In such cases, the most satisfactory results are usually obtained by the use of powdered Acacia or Tragacanth.

Of the several methods of producing an emulsion, the following are usually the most satisfactory, the emulsifying agent being used either as a dry powder or in the form of mucilage.

The following formula will serve as an example of the first method: Place the oil in a dry mortar, add the dry powdered gum, *using one-fourth as much gum as oil*, and stir lightly and rapidly with the pestle until the oil and gum are thoroughly mixed. To the thick mixture of oil and gum, a quantity of water equal to *half the quantity of oil* is added, and the stirring continued until a homogeneous mixture free from visible oil globules is produced. This constitutes the nucleus or primary emulsion, and may be diluted with other liquids, added gradually with constant trituration.

Another manner of using a dry emulsifier is seen in the official Emulsion of Chloroform. In this case the powdered gum and chloroform are placed in a bottle together and thoroughly mixed by agitation, after which the water is added and the agitation continued. This method is applicable to essential oils and volatile liquids generally.

The best proportions of ingredients for the nucleus are 4 parts of oil to 2 parts of water and 1 part of powdered Acacia. Some operators prefer one and a half times as much water as gum. When powdered tragacanth is used, a smaller proportion of gum will generally answer. Volatile oils, as a rule, require about twice as much gum as fixed oils.

When a liquid emulsifier, as mucilage, is used, it is placed first in the mortar, and small quantities of oil added with constant trituration, each portion being thoroughly emulsified before further addition of oil. Or, the mucilage may be placed in a bottle and the oil added in small portions, shaking thoroughly between each addition. A good mucilage of acacia is capable of emulsifying nearly twice its bulk of fixed oil. When the oil has all been emulsified in this manner, either in a mortar or in a bottle, the remaining liquids may be added gradually with constant trituration or agitation.

The important part in preparing an emulsion is the making of the "nucleus," or "primary emulsion," which, if properly made, may be diluted with safety with the remaining liquid.

"Cracking of the nucleus" is a term applied to a condition where the oil, instead of being enveloped by the gum, remains scattered over its surface in shining globules, and is known from the pearly appearance of the mass. The cause may be an excess of oil, its too rapid addition, too hard pressure with the pestle, too long continued trituration, etc. A cracked emulsion may frequently be restored by adding it gradually, with trituration, to a fresh quantity of the original emulsifier.

Alcohol and alcoholic liquids generally tend to break up emulsions, and if required in the mixture, should be added gradually and toward the end of the operation. Alkaline substances generally aid in emulsification by their property of forming soap-like bodies with many fats and resins. The emulsification of such substances as chloroform and volatile oils is generally aided, and their keeping qualities improved, by the presence of a fixed oil.

Four emulsions are official. Two are made from gum resins, the gum naturally present serving as the emulsifier, one from a seed, in which the emulsifying agents are acacia and sugar in conjunction with the natural emulsionizing substances of the seed, and the fourth is an emulsion of Chloroform in which the emulsifying agent is powdered tragacanth, assisted by the expressed Oil of Almond. These four preparations were all official in the Pharmacopœia of 1880 under the title of "Mixtures." The appropriateness of their present title is evident. It is to be regretted that the Pharmacopœia does not include a formula for the preparation of the much used Emulsion of Cod Liver Oil.

Emulsions are sometimes known as "milks," as "Milk of Almond," "Milk of Asafetida," etc.

EMULSIONS OF GUM RESINS.

Emulsum Ammoniaci.—Emulsion of Ammoniac.

Emulsum Asafetidæ.—Emulsion of Asafetida.

Both emulsions are made by a common formula. Forty Gm. of Ammoniac, or Asafetida, in selected tears, are rubbed in a warm mortar with 900 Cc. of water, at first very gradually added, until a uniform emulsion results. The emulsion is then strained into a graduated vessel, and the mortar and strainer rinsed with sufficient water to bring the measure to 1,000 Cc. The powdered gums should not be used.

Stimulant, expectorant and mildly laxative. The Asafetida is also anti-spasmodic. Dose of each, 15 to 30 Cc.

SEED EMULSION.

Emulsum Amygdalæ. Emulsion of Almond.—Sixty Gm. of Sweet Almond are blanched and beaten in a mortar with 10 Gm. Powdered Acacia and 30 Gm. Sugar until they are thoroughly mixed. The mass is then rubbed with 900 Cc. of Water, at first very gradually added, strained into a graduated vessel, and mortar and strainer washed with sufficient Water to make 1,000 Cc.

This preparation, also known as Milk of Almond, is unstable, and should be prepared when wanted. It is a nutritive demulcent; dose, 30 to 250 Cc. or *ad lib.*

EMULSION OF A VOLATILE LIQUID WITH A FIXED OIL.

Emulsum Chloroformi. Emulsion of Chloroform.—Introduce 15 Gm. Tragacanth in a very fine powder into a bottle of sufficient capacity, add 40 Cc. Chloroform, and shake thoroughly so as to wet every part of the bottle. Add 250 Cc. Water and incorporate by vigorously shaking, then add 60 Cc. Expressed Oil of Almond, in several portions, shaking after each addition, and when emulsified, add water gradually with constant shaking to make 1,000 Cc.

A permanent emulsion, if properly made, and a convenient form for the administration of chloroform.

Dose, 15 to 30 Cc.

SENIOR COURSE, LECTURE No. 14.

Pharmaceutical Latin.

BY PROF. WILBER G. COMPHER, A.M., PH.D.

Fourth and Fifth Declensions.

There are but few nouns of these declensions, even in the classical Latin, and still fewer of use in pharmacy.

The endings are as follows:

Fourth Declension.			Fifth Declension.	
Singular.			Singular.	
	Masculine.	Neuter.		
N.V.	us.	u.	N.V.	es.
G.	us.	us.	G.	ei.
D.	ui.	u.	D.	ei.
Ac.	um.	u.	Ac.	em.
Ab.	u.	u.	Ab.	e.
Plural.			Plural.	
N.V.	us.	ua.	N.V.	es.
G.	uum.	uum.	G.	erum.
D.	ibus.	ibus.	D.	ebus.
Ac.	us.	ua.	Ac.	es.
Ab.	ibus.	ibus.	Ab.	es.
N.V.	spirit-us.		N.V.	di-es.
G.	spirit-us.		G.	di-ei.
D.	spirit-ui.		D.	di-ei.
Ac.	spirit-um.		Ac.	di-em.
Ab.	spirit-u.		Ac.	di-e.
Spiritus, Spirit.			*Dies*, Day.	
Singular.			Singular.	
Plural.			Plural.	
N.V.	spirit-us.		N.V.	di-es.
G.	spirit-uum.		G.	di-erum.
D.	spirit-ibus.		D.	di-ebus.
Ac.	spirit-ibus.		Ab.	di-ebus.

Pronouns.

Pronouns are divided into six classes: Personal, Possessive, Demonstrative, Relative, Interrogative and Indefinite.

The Personal pronouns designate the person, and are seldom used except for emphasis, as the person is implied in the endings of the verb.

The Personal pronouns are *ego, I*; *tu, thou*; *sui, of himself*, and are declined as follows:

	Ego.	*Tu.*	*Sui.*
		Singular.	
N.	ego.	tu.	(wanting).
G.	mei.	tui.	sui.
D.	mihi or mi.	tibi.	sibi.
Ac.	me.	te.	se.
V.	(wanting)	tu.	(wanting).
Ab.	me.	te.	se.
		Plural.	
N.	nos.	vos.	(wanting).
G.	nostrum. nostri.	vestrum. vestri.	sui.
D.	nobis.	vobis.	se.
V.	(wanting)	vos.	(wanting).
Ab.	nobis.	vobis.	se.

The Possessives are:

meus,-a,-um, my.
tuus,-a,-um, thy, you.
suus,-a-um, his, hers, its.
noster,-tra,-trum, our.
suus,-a-um, their.

These are all declined like adjectives of the first and second declensions.

The Demonstratives point out definitely the objects to which they refer. They are: *hic*, this; *iste*, that; *ille*, that: *is*, he, that; *idem*, the same; *ipse*, self, himself; and are declined as follows:

Hic, he, she, it, this. *Iste*, that, that of yours.

	Mas.	Fem.	Neuter.	Mas.	Fem.	Neuter.
		Singular.			Singular.	
N.V.	hic.	haec.	hoc.	iste.	ista.	istud.
G.	hujus.	hujus.	hujus.	istius.	istius.	istius.
D.	huic.	huic.	huic.	isti.	isti.	isti.
Ac.	hunc.	hanc.	hoc.	istium.	istam.	istud.
Ab.	hoc.	hac.	hoc.	isto.	ista.	isto.
		Plural.			Plural.	
N.V.	hi.	hae.	haec.	istae.	isti.	ista.
G.	horum.	harum.	horum.	istorum.	istarum.	istorum.
D.	his.	his.	his.	istis.	istis.	istis.
Ac.	hos.	has.	haec.	istos.	istas.	ista.
Ab.	his.	his.	his.	istis.	istis.	istis.

Ille, That (Yonder). *Is*.

	Mas.	Fem.	Neuter.	Mas.	Fem.	Neuter.
		Singular.			Singular.	
N.V.	ille.	illa.	illud.	is.	ea.	id.
G.	illius.	illius.	illius.	ejus.	ejus.	ejus.
D.	illi.	illius.	illius.	ei.	ei.	ei.
Ac.	illum.	illam.	illud.	eum.	eam.	id.
Ab.	illo.	illa.	illo.	eo.	ea.	eo.
		Plural.			Plural.	
N.V.	illi.	illae.	illa.	ei or ii.	eae.	ea.
G.	illorum	illarum.	illorum.	eorum.	earum.	eorum.
D.	illis.	illis.	illius.	eis or iis.	eis or iis.	eis or iis.
Ac.	illos.	illas.	illa.	eos.	eas.	eis or iis.
Ab.	illis.	illis.	illis.	eis or iis.	eis or iis.	ea.

Idem is formed from *is* and the suffix *dem*, and is declined like *is*, excepting where *m* would come before *d*, *m* is changed to *n*; as, the accusative singular is *eundem*, *eandem*, *idem*; genitive plural, *eorundem*, *eorundem*, *eorundem*.

Ipse, self.

	Mas.	Fem.	Neut.
		Singular.	
N.V.	ipse.	ipsa.	ipsum.
G.	ipsius.	ipsius.	ipsius.
D.	ipsi.	ipsi.	ipsi.
Ac.	ipsum.	ipsam.	ipsum.
Ab.	ipso.	ipsa.	ipso.
		Plural.	
N.V.	ipsi.	ipsae.	ipsa.
G.	ipsorum.	ipsarum.	ipsorum.
D.	ipsis.	ipsis.	ipsis.
Ac.	ipsos.	ipsas.	ipsa.
Ab.	ipsis.	ipsis.	ipsis.

Qui, who etc.

	Mas.	Fem.	Neut.
		Singular.	
N.	qui.	quae.	quod.
G.	cujus.	cujus.	cujus.
D.	cui.	cui.	cui.
Ac.	quem.	quam.	quod.
Ab.	quo.	qua.	quo.
		Plural.	
N.	qui.	quae.	qua.
G.	quorum.	quarum.	quorum.
D.	quibus.	quibus.	quibus.
Ac.	quos.	quas.	quae.
Ab.	quibus.	quibus.	quibus.

It will be noticed that these are irregular forms of adjectives of the first and second declensions. This will very greatly assist in learning these pronouns, and the same is true of the Relative, Interrogative and Indefinite pronouns. The Relative *qui, who, which*, will serve as a model of these pronouns.

The Interrogative *quis*, has *quis, quæ, quid*, in the nominative; the other cases are the same as those in *qui*.

Exercises.—Translate: Hic homo hi homines, hæc caro, illa basis, istæ artes, istis arboribus, hoc animal, his pensis, quis pes? Quid præscriptum?

The Indefinites do not refer to any particular person or thing. The most important are *quis* and *qui* with their compounds, as *aliquas, quisquam, quidam, quisquam*. These compounds are declined like *quis* and *qui*.

Adverbs.

Adverbs, as in English, qualify verbs, adjectives and other adverbs. Most adverbs are derived from adjectives, especially from the neuter of adjectives and depend upon them for their comparison.

This is formed regularly by using the accusative neuter singular of the adjective in the comparative degree for the comparative of the adverb, and by changing the superlative neuter ending in *e*.

For example: Adjective—Altus, altior, altissimus.
Adverb—Alte, altius, altissime.

When the adjective is irregular, the adverb formed from it will be compared irregularly, also:

Adjective—Bonus, melior, optimus.
Adverb—Bene, melius, optime.

A brief list of adverbs follows:

Abhinc, since, ago.
Adhuc, hither.
Adversus, opposite, (used also as prep).
Aeque, equally.
Antea, before, formerly.
Attente, attentively.
Bene, well.
Breviter, briefly.
Caleriter, swiftly.
Certe, certainly, surely.
Cito, quickly.
Cras, to-morrow.
Denique, finally.
Diligenter, diligently.
Diu, for a long time.
Etiam, also, even as.
Facile, easily.
Fere, almost.
Ferve, hotly.
Firme, firmly.
Gradatim, gradually.
Frustra, in vain.
Haud, not.
Hodie, to-day.
Huc, hither.
Ibi, there.
Ideo, therefore.
Illuc, thither.
Ita, thus, so.
Item, in like manner.
Jam, now.
Lente, slowly.
Male, badly.
Maxime, most.
Mox, soon.
Nunc, now.
Numquam, never.
Optime, best.
Paene, almost.
Primo, at first.
Quare, why.
Quomodo, how.
Quoque, also.
Saepe, often.
Saltem, at least.
Satis, enough.
Semel, once.
Semper, always.
Sic, so.
Supra, above.
Tam, so.
Tum, then.
Ubi, where.
Unquam, ever.

Numeral Adjectives.

These denote number, and are divided into three classes, *cardinal*, *ordinal* and *distributives*. The cardinal and ordinal are all that we need consider. The ordinals are all declined like adjectives of the first and second declensions. The cardinals from *quatuor*, four, to *centum*, one hundred, inclusive, are indeclinable. The hundreds are declined like the plural of *prunus*.

	Cordinals.	*Ordinals.*
1.	Unus, una, unum, one.	Primus, first.
2.	Duo, duae, duo, two.	Secundus, second.
3.	Tres, tria, three.	Tertius, third.
4.	Quator.	Quartus, fourth.
5.	Quinque.	Quintus, fifth.
6.	Sex.	Sextus.
7.	Septem.	Septimus.
8.	Octo.	Octavus.
9.	Novem.	Nonus.
10.	Decem.	Decimus.
11.	Undecim.	Undecimus.
12.	Duodecim.	Duodecimus.
13.	Tredecim.	Tertius decimus.
14.	Quatuordecim.	Quartus, decimus.
15.	Quindecim.	Quintus decimus.
16.	Sexdecim.	Sextus decimus.
17.	Septendecim.	Septimus decimus.
18.	Duodeviginti.	Duodevicesimus.
19.	Undeviginti.	Undevicesimus.
20.	Viginti.	Vicesimus.
30.	Triginta.	Tricesimus.
40.	Quadraginta.	Quadragesimus.
50	Quinquaginta.	Quinquagesimus.
60.	Sexaginta.	Sexagesimus.
70.	Septuaginta.	Septuagesimus.
80.	Octaginta.	Octogesimus.
90.	Nonaginta.	Nonagesimus.
100.	Centum.	Centesimus.
1000.	Mille.	Millesimus.

Exercises: Duo viri sanati erant. Sex pilulæ misceebantur. Puer canes quinque habet. Medicus remedia centum habet. Homo primus et mulier tertia. Dies decima unciæ quindecim. Hic vir est octavus. Ille puer est undecimus. Ego, medicus, te, servum, sanabit.

You have three servants. The mixture weighs five ounces. That shelf has ten bottles. This boy filtered seven drops. I shall mix twelve parts. Eighteen days. Thirty pounds. The boy is fourth. That girl is second. That clerk will cure the three wounds.

Prepositions.

Prepositions are used mainly with the accusative and ablative cases. The following are used with the ablative:

a or *ab*, by, from.
cum, with.
de, concerning.
e or *ex*, out of, from.
in, in, on.
pro, before, for.
sine, without.

The following with the accusative:

ad, to, toward.
sub, near, towards.
in, into, towards.
ante, before, etc.

Exercises: A medico, cum homine, ad fontem, e corde, in ignem, ante diem, sine pane, de pace, pro penso.

Translate into Latin: To the doctor, with the girl, before the lesson, into the blood, before the day, without health.

THE DRUG BUSINESS IN CUBA.

United States Consul P. F. Hyatt, who is a physician and pharmacist, in reporting upon the drug trade at Santiago de Cuba under date of March 2, 1898, says:

Any registered druggist may open a drug store or pharmacy, or, if the owner is not a registered druggist, he must employ one so licensed to stand sponsor for the store. For this service they pay from $40 to $80 per month for the use of a pharmacist's name.

The sine qua non of the drug store is a registered pharmacist, who in many cases is not the owner and, in fact, seldom goes near the store except to draw his salary. This, with rent, clerk hire, light, and other incidentals, make the expenses for a small business, and the owner tries hard to get this amount back as quickly as possible and consequently does not vie with his neighbor in cutting prices.

In the United States druggists, as a rule, in compounding prescriptions regulate the price by a certain rate for tinctures, fluid extracts, etc., adding an extra 5 or 10 cents for bottle, label, cork, etc. No such rule prevails here, and I never saw a cost or selling mark on any goods whatever. Neither does a merchant feel himself bound to sell an article to-morrow at the same price he did to-day, and a renewed prescription nearly always costs more than the original.

The practice of substitution is very general, and physicians seldom take exceptions, as they are usually silent partners in the profits.

A prescription which cost me 90 cents I asked to have tripled, hoping it would come cheaper, and the bill was $5. I remonstrated, and the reply was that the price of the material had advanced. I requested the druggist to produce the prescription and let us figure on the cost, and he was greatly surprised to find that I not only read the prescription with ease, but also knew the wholesale prices of the drugs, which for the tripled size footed up 30 cents; he then reduced the price to $2.50.

A store where prescriptions are compounded is called in Spanish farmacia, while a wholesale house is a drogueria. The latter need not be owned or managed by a registered pharmacist. There are only three wholesale druggists on the island, all in Havana. They are owned by Lobe & Co., Sarra Bros., and Johnston & Co.

Coarse drugs or chemicals used for commercial and manufacturing purposes, such as borax, sulphate of iron, etc., are sometimes sold by hardware stores; all other drugs are confined to the legitimate drug trade. Perfumery, toilet and fancy articles are sold by the haberdasher. There are no attempts to undersell a neighboring merchant; each man usually tries to sell higher than his neighbors.

To be a licensed pharmacist one must hold a certificate granted by a Spanish or Cuban university. These licenses are of two kinds, temporary and permanent. The first is obtained by the payment of $400 (gold), and is good for six years; the latter by undergoing an examination and the payment of a somewhat larger sum.

Consul Barnes at Cologne, Germany, commends, as worthy of imitation in this country, the requirement by the Government that all drug stores must be arranged in a specifically prescribed manner. Under this regulation any new apprentice or assistant may know readily and exactly where to find the desired drug without the necessity for further inquiry or additional instruction. The location of the drug is the same in all stores, and the interior construction of the storerooms, as near as permissible, is the same.

AN HISTORICAL STUDY OF SASSAFRAS.*

BY PROF. JOHN URI LLOYD, PH.M.

Cincinnati, Ohio.

General Remarks.

This tree at one time created greater interest in the old world than any other American product, not excepting tobacco. Its early history is marvelous. Before any other American product had made an impression on European medicine, ships were dispatched to the new land for the sole purpose of collecting sassafras. Even as late as 1622 it is shown that in Virginia the colonists were equally concerned in exporting tobacco and sassafras. The history of sassafras is the history of a new remedy asserted to possess wonderful qualities. Its way to Europe was marked by the blood of French and Spanish explorers. Linked with the birth of sassafras are to be found the names of the men who struggled for mastery in Florida. From the landing of Ponce de Leon in 1513 to the expedition of De Soto in 1538, throughout the struggles of the French Huguenots under Jean Ribault and Rene Laudonniere until finally the sad ending of that French colony was accomplished by the cruel Spanish general Pedro Melendez; the drama closing in the revenge on the Spanish by the French nobleman Dominic de Gourgues; sassafras served its part as a remedy sought alike by all. It was one of the objects of the conquest in this land of the sassafras tree. The history of medicines shows that with the discovery of every new land came reports concerning numerous new remedies found in those lands, and history teaches that these valued products often marked their way in privation, blood and toil; in conquest and in shame. Such is the record of sassafras, and perhaps the fragrant tree is conspicuous over other drugs for its part in events that concerned man and nations when conquest was the law of nations, and massacre was common in the name of justice.

History of Sassafras.

Sassafras is indigenous to the Western Hemisphere, occurring in Florida, Virginia and as far North as Canada. It is found as far West as Kansas, but is there very scarce. Its occurrence in Brazil is recorded by Piso (1658). Sassafras was in medicinal use among the natives of Florida long before Ponce de Leon in 1512 set foot on the soil of this peninsula. It is generally stated and believed that the Spaniards of 1538, which is the date of De Soto's invasion of Florida, were the first Europeans to obtain knowledge of this drug; yet we can find no record of such a discovery in at least two narratives of this expedition that are accessible to us. On the other hand, there seems to be sufficient evidence of the fact that the Spaniards gained a knowledge of Sassafras and its medicinal virtues through the French Huguenot emigrants, who under their unfortunate leaders, Jean Ribault and Rene Laudonniere, occupied Florida between the years 1563 and 1564.

To the Spanish physician, Nicolaus Monardes, of Sevilla, in 1574, is to be credited the first detailed description of sassafras and its healing virtues, his information being gained, however, not from any actual experience in the sassafras lands, but from personal consultation with travelers, and the government records at his command. From Clusius' version of Monardes (1593), it is learned that the drug was imported from Florida into Spain some years previous to 1574, that the Spaniards in Florida, when overtaken by fevers, and other diseases consequent to miasma and unwholesome drinking water, were advised by the few remaining Frenchmen to use this drug, which was called by the French *Sassafras* (for reasons unknown to Monardes) and *Pawame* by the Indians, from whom the French obtained their information. Monardes (in Clusius' version) adds that sassafras grows in Florida in maritime places, such as are neither too dry nor too moist, being especially plentiful near the harbors of St. Helena and St. Matthew, where they form whole woods, which exhale such a fragrance that the Spaniards who first landed believed the tree to be the same as the Cinnamon tree of Ceylon. Clusius recognized the fact that the root ranks first in value, the branches next and the trunk last; but that the bark is to be preferred.

For this reason, he adds, the root is given medicinally in the smallest quantity, the branches in larger amount, and the wood of the trunk is equal in value to half the weight of the root. Nor should it be cut for a longer period than one year and should not be deprived of its bark, or else it becomes useless.

The illustration given by Monardes of the Sassafras tree, has been widely copied in the herbals of the 16th and 17th centuries, among which we may name, Dalechamps, (1586), Joh. Bauhinus, (1650), and Piso (1658) the latter giving it the Brazilian synonym *Anhuiba.*

Francisco Hernandez, another Spanish physician who traveled through Mexico between the years 1571 and 1577, speaks of tho occurrence of sassafras at Hechuacan in Mexico. His work was translated by Francisco Ximenez, a monk of the Convent of San Domingo, of Mexico, in 1615.

The latter author is quoted at length on the subject of sassafras by Jean de Laet, a noted Dutch geographer (who died 1649) whose work "Novus orbis" etc., 1633," testifies to the probably French origin of the knowledge of Sassafras. Having taken the account given by Laudonniere as his source, he speaks in Chapter XIV, concerning the land and inhabitants of the part of Florida traversed by the French, and calls attention to the tree as being prominent in the woods, and refers to the exquisite odor of its wood and bark. He states that this tree is called *Pawame* by the Indians and sassafras by the French.

Prof. Flückiger remarks that he was unable to find the passage alluded to in Laudonniere's own report of 1586, and diligent search on our part in a verbatim reprint of this work of 1853, likewise failed to produce the passage. The term "*esquine*"* occurring therein might have been the passage referred to, but it hardly stands for sassafras, for it is stated (p. 6 and p. 76) that it is a twining vine, good against pocks (la verole); on p. 133 a root is mentioned from which Indians produce flour to make bread, and on page 155, it is stated that the colonists in a period of distress used the wood of this "esquine" to make flour and bread, which precludes sassafras from being the tree referred to. However, it is further stated (p. 10) that in councils of war or peace, the native king gathers around him the priests and the elders of the tribe, and that they drink from the same vessel a decoction quite hot, called by them *Cosine*, made from the leaves of a certain tree. This might refer to sassafras, for the further statement is made that this potion has the effect of causing abundant sweat.

It must in our opinion, with due deference to preceding authorities, be mere conjecture as to whether any of their descriptions answers to sassafras.

De Laet credits Ximenez with the statement that sassafras wood has the property of rendering sea water palatable, as experienced by Ximenez on a voyage from Florida to Vera Cruz in 1605.

Soon after the discovery of sassafras, the drug was exported to Europe, as before stated, and became at once known in Spain and France. It was well known in Frankfort-on-the-Main as early as 1582, and in Hamburg in 1587, when it was termed *Lignum pavanum seu floridum seu xylomarathri* (fennel-wood). Sailing expeditions to America were undertaken in those times to secure the wood as well as the root. An English merchant, Martin Pring, is recorded by Charles Pickering as having with two small vessels arrived on the American coast in the beginning of June in 1603. The point named is 43 degrees and 44 degrees northern latitude among a multitude of islands. Following the coast south, in search of sassafras, he entered a large sound, and on the north side in the latitude 41 degrees and "odde" minutes, built a hut and enclosed it with a barricade, where some of the party kept guard while others collected sassafras in the woods. The natives were treated with kindness, and the last of the two vessels departed freighted on the 9th of August.

In connection with the introduction of sassafras root into England, Daniel Hanbury unearthed the following interesting record contained in the Calendars of State Papers of the Public Record Office:

"Instructions for suche things as are to be sente from Virginia, 1610.

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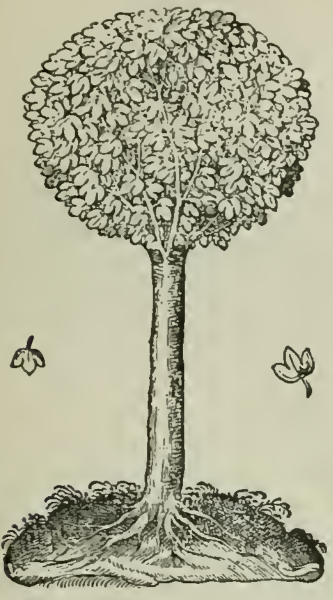
* The thanks of the author are extended to Mr. C. G. Lloyd and to Dr. Sigmond Waldbott, Librarian of the Lloyd Library, for invaluable assistance.

* Squine, French for China root, which may mean either *Smilar China* or *Galangal* root. (Webster's Dict. and pharmaceutical authorities.)

(1) Small sassafras rootes to be drawen in the winter and dryed and none to be medled with in the somer and it is worthe 50£ and better, p. Tonne," etc.

But still, the exact botanical origin of sassafras was not known to the writers of the 17th century. While they were well acquainted with the peculiar foliage and the other characteristics of the tree, the flowers and the fruit were expressly stated to be unknown by such writers as Clusius (Monardes), (1593), Joh. Bauhinus, (1650) and Piso (1658).

Two early statements concerning the fruit may, however, now be recorded:



Anhuite sive Sassafras.

Taken from Gulielmi Pisonis, "De Indae Utriusque Re Naturali et Medica," Libri xiv., p. 145; Amstelaedaim, 1658.

Casper Bauhinus, who named the sassafras tree "arbor ex Florida ficulneo folio," in 1623 reports that specimens of the leaves and the fruit of the tree were sent to him by Dr. Doldius, of Nuremberg, and he describes the fruit as oblong, rugose and attached to very long pedicels.

Likewise, Jean de Laet in the index to the chapter on sassafras of his aforementioned book, requests the reader to insert in the text that the fruit of this tree was brought to the notice of the author by a person returning from Novo Belgio, and adds that the fruit does not differ much in form from the berries of the laurel, although it is much smaller. It contains a white nut of bitterish taste, divided into two parts.

As far as we can ascertain, Plukenet as late as the year 1681 was the first to give an illustration of the berry, which is faulty, however, because it is devoid of the acorn-like calyx. The tri-lobed leaves are also illustrated, and the botanical name affixed by Plugenet is "Cornus mas odorata, foliis trifido, margino plano, Sassafras dicta."

Catesby, true to his task as set forth in the title of his book on the natural history of Virginia, etc., viz: to correct faulty illustration of plants by preceding authors, gives (in 1731), a good picture of sassafras, including the fruit and flowers.

In the middle and latter part of the 18th, and the earlier part of the 19th century, sassafras was studied in its native country by such celebrated travelers as Peter Kalm, J. David Schoepf, F. A. Michaux and Fred Pursch. Peter Kalm's account especially contains many points of interest which it may be well to partly reproduce in abstract. He states that:

Sassafras is called in the Swedish vernacular *Saltenbras* (sometimes Salssenfras), no doubt a corruption of sassafras, in allusion to the property this wood has of exhibiting a peculiar crackling noise when thrown in the fire, which readily suggests the similar property of common table salt.[*]

The tree grows to a respectable height in Pennsylvania under 40 degrees n. l. (*2), but becomes dwarfish farther north, e. g., at Oswego or Fort Michelson, i. e., between the 43d and 44th degrees, where it attains a height of scarcely 4 feet (2 *alnar*) and a thickness not to exceed that of a man's little finger. It springs up in old neglected fields, being among the first trees that make their appearance in such places, which suggests to the author the manner in which birches frequently grow in Sweden. The soil where sassafras thrives is a loose earth of a pale tile color, consisting mostly of sand, dashed with a little clay. Never was he aware that the tree stood on humid or low-lying places. In this connection it may be well to quote the statement of early authors to the effect that the sassafras tree cultivated in Europe is not known to flower, and consequently bears no fruit. The fruit used in the propagation of the tree must therefore be imported from America, and the precaution must be taken to place it in earth prior to shipping it. Sometimes a period of one to three years will elapse before the seeds take root. Kalm states that the tree might be propagated from shoots, but the author observes that they do not take root readily. The best mode of propagation is from seeds, but the berries are difficult to obtain, because birds greedily devour them before they are even half ripe; also the young shoots are subject to attack by cows. Sassafras root and bark are used for various domestic purposes.

The bark is used by women to dye woolen goods a handsome orange color, which is so permanent that it resists the bleaching action of the sun. The boiling of the bark is done in bronze pots, as iron pots would affect the color.

The fragrant principle is believed to protect sassafras against decay, hence the wood is frequently used as posts or stakes for garden fences. It is also reputed to expel bed bugs, and bedsteads have been made of such wood. Kalm adds that this material is efficient only as long as the wood retains the smell, i. e., about two or three years. In Pennsylvania it has been the custom to place chips of sassafras wood or of the root in wardrobes to keep moths away; Kalm has seen root which lay 5 to 6 years in a table drawer and had still retained its strong smell. Kalm finally relates several instances where sassafras was used with much success in curing various diseases. He states that at one time it was the custom in London to drink as a tonic a tea made of the flowers and chips of sassafras. This custom fell into discredit, however, when sassafras became a notorious remedy for syphilitic and similar diseases.

Regarding the botanical nomenclature of sassafras, Linnæus in 1737 assigned it to the genus Laurus, upon the examination of a specimen of the flower which proved to be clearly distinct from the genus Cornus, to which Plukenet had assigned it. In 1753, he gave it the name Laurus Sassafras. The botanical name subsequently underwent the following changes:

Laurus Variifolia, Salisbury.

Sassafras Officinale, Nees V. Esenbeck & Endlicher, 1831.

Sassafras Sassafras, Karsten, 1880-82,

Sassafras variifolium (Salisbury), O. Kuntze, adopted in the U. S. Pharmacopœia, 1890.

Pharmacopœial and Commercial Notes.

The wood of the sassafras tree was the part first exported to Europe, as is evidenced from the fact that old European drug lists and pharmacopœias mention only the wood, lignum sassafras (Pharm. Lond. 1650 and 1680), or lignum Sassaphras, (Pharm. Ultrajectina, 1664). See also our historical references. Subsequently, the root, as the more efficient part of the tree, gradually gained favor. Yet we find that some of the later pharmacopœias (e. g. Pharm. Witenbergica, 1750) began to describe, under the caption Lignum Sassafras, the *root* covered with its bark, this part being also official at present (with or without bark) under the same name in many pharmacopœias. The U. S. Pharmacopœia recognizes the bark of the root under the name Sassafras, and the pit under the name Sassafras Medulla.

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[*] Wiltstein derives Sassafras from *Salsafras*, the Spanish word for Saxifrage, breaking the stone, in allusion to its alleged property of dissolving and removing calculi.

[*2] 40 to 50 feet high, and of larger dimensions even further South, where Pursh has seen trees of 2 feet in thickness.

The oil of sassafras, however, is at present recognized only in a few Pharmacopœias, namely the Spanish, French and the U. S. Pharmacopœias, while many of the older works (e. g. Pharm. Amstelodamensis nova. 1792) gave directions for its preparation by the apothecary.

The bulk of Sassafras Oil is manufactured in the United States, especially Virginia, New Jersey and Pennsylvania and North Carolina, the operation being conducted in some places as a crude home industry; in others, however, on a respectably large scale. Baltimore until recently has been the center of trade in this article, but New York seems to have become the principal market in recent years.

Enormous amounts of sarrafras root are thus consumed, judging from the statements alone that in 1883 in Buckingham county, Virginia, 40 distilleries within a small compass of land were engaged in the manufacture of sassafras oil; consuming daily 80,000 lbs. of the root, which yielded about 50 gallons of oil, weighing about 450 lbs.

In some parts of the Southern States, the distillation is carried out systematically on a large scale. The owners of the sassafras grounds, desirous of converting them into arable fields, allow the removal of the root free of charge, if the diggers consent to fill up the holes and, cut, pile, and leave the trunk of the trees on the land. Great quantities of sassafras are thus obtained and large tracts of ground cleared. It has been stated that old stumps yield as much oil as green ones.

After the roots are split with axes and wedges, they are chopped by means of chopping machines which are capable of chopping 20,000 pounds in 3 hours, an amount which constitutes a charge for the subsequent distillation by means of steam. Continuous steaming exhausts the root in 50 hours, and produces about 20 gallons of oil (weighing about 180 lbs.)

The finished product is shipped to the New York market in 5 gallon cans, each can containing about 45 lbs. of the oil.

According to recent market reports by Messrs. Schimmel & Co., (October 1897 and afterwards) the competition of *Safrol* (the artificially produced principle contained in the oil) owing to its high price, has not been able to supplant the natural oil.

But these commercial conditions are changing constantly, as well as are the methods and locations of manufacture.

Addendum.

And now, in conclusion, I feel it proper to add my personal experience with sassafras, part of which intrudes on points already named. My boyhood was spent in the country, in Kentucky, where sassafras abounds. I do not remember to have smelled the fragrance of sassafras trees mentioned by these early authorities unless the trees were broken or bruised. I have passed through great thickets of young and old trees, and am sure that the statement that the fragrance is wafted far out to sea is over-drawn, as I observed no odor whatever, and am convinced that sassafras exhales no aroma. When land in Kentucky is "worked poor" and turned out to rest, it is likely to spring up in thickets of sassafras, persimmon and black locust. I have heard old farmers in speaking of a farm, say it was too poor to raise sassafras, and no greater reflection could be made on that land. No especial value is put on sassafras wood; it is not sought for fence posts, nor is it used to drive away insects of any description. As a remedy, it is used in the spring to "thin the blood," being drunk as a tea. Indeed, I do not dislike it as a beverage, early impressions leading me now to occasionally take a package of fresh bark home with me for a family dish of sassafras tea. This is made exactly like coffee; is prepared as a beverage, and is sweetened and used with cream in the same way. That sassafras tea was a very common beverage in my boyhood's days, may be shown by the following incident: I was traveling up the Ohio river on one of the palatial steamers of other days, and the waiter asked a Kentuckian at my side who ordered tea, "what kind of tea he wanted?" "Store tea," he answered, "kin git pleanty of sassafras at home."

It was not customary for sassafras tea drinkers to keep the root bark separated from the root. They would shave the recently dug roots as the bark was used. Kentuckians claim that there are two varieties of sassafras, the red sassafras and the white, distinguished only by the bark. The white sassafras is not so aromatic, and is bitter to the taste, and they use only the red bark.

Taken from Le Page Du Pratz' "Histoire de la Louisiana." Paris, 1758, Vol. II., p. 36.

In addition to the wood, root and bark, mucilage of the pith is employed in domestic medicine to bathe inflamed eyes. I find a complete description of the domestic uses of Sassafras in Rafinesque's Medical Flora, 1830, which for various reasons I feel called upon to reproduce as an ending to this record of sassafras.

"Found from Canada to Mexico and Brazil. Roots, bark, leaves, flowers fragrant and spicy. Flavor and smell peculiar, similar to fennel, sweetish subacid, residing in a volatile oil heavier than water. The Sassafrine, a peculiar mucus unalterable by alcohol, found chiefly in the twigs and pith, thickens water, very mild and lubricating; very useful in ophthalmia, dysentery, gravel, catarrh, etc. Wood yellow, hard, durable, soon loses the smell, the roots chiefly exported for use as stimulant, antispasmodic, sudorific and depurative; the oil now often substituted; both useful in rheumatism, cutaneous diseases, secondary syphilis, typhus fevers, etc. Once used in dropsy. The Indians use a strong decoction to purge and clean the body in the spring; we use instead the tea of the blossoms for a vernal purification of the blood. The powder of the leaves used to make glutinous Gumbos. Leaves and buds used to flavor some Beers and Spirits. Also deemed vulnerary and resolvent chewed and applied, or menagogue and corroborant for women in tea; useful in scurvy, cachexy, flatulence, etc. Bowls and cups made of the wood; when fresh it drives the bugs and moths. The bark dyes wood of a fine orange color called Shikib by Missouri tribes, and smoked like tobacco."

(The paper concluded with a bibliography of 28 citations). (Read at the regular October meeting of the New York College of Pharmacy).

BALATIN is the name of a natural product obtained from a South American tree, in form of a thick, white fluid, which, when applied to the skin, leaves a transparent, elastic, and impenetrable covering. The substance is miscible with water, has a peculiar odor, is coagulated by chloroform and alcohol, and is entirely non-irritant, even to open wounds. (Ap. Ztg.)

FOR PERSPIRING OF THE FACE Monin (Ther. der Geg.) recommends the following mixture: Lavender water, peppermint water, lemon water, tincture of myrrh, tincture of quillaya, of each 5 parts, sodium benzoate 2 parts. The mixture is applied three times daily by means of a cloth, which is first saturated with water and wrung out, and then moistened with the mixture.

THE PHARMACY OF SASSAFRAS.

BY PROF. GEO. C. DIEKMAN.
New York College of Pharmacy.

The parts of the sassafras plant which are of pharmaceutical interest or importance are the bark of the root, the pith, the volatile oil and the leaves. The bark of the root is official in the U. S. Pharmacopœia, and as found in commerce consists of small irregular fragments of a reddish or rust-brown hue, brittle, with a short corky fracture, the fractured surface appearing lighter in color than the older, exposed, parts. The bark when living is nearly white, but soon after collecting it turns dark. It possesses a highly fragrant odor, and its taste is sweet and aromatic and somewhat astringent. The constituents to which these properties are due may be extracted by water and alcohol.

The bark enters into the official "extractum fluidum sarsaparillæ compositum" and the official "decoctum sarsaparillæ compositum." The first of these forms the basis of the compound syrup of sarsaparilla.

The uses of the bark are varied, although as a rule it is employed as a flavoring agent in combination with other, more active remedies. In the South it is used in connection with china briar (smilax) in the form of an infusion which possesses diuretic and diaphoretic properties. The housewife in the South employs the root together with copperas for the purpose of dyeing fabrics a drab color.

The medicinal value of the root was recognized by the medical department of both the Confederate and Union armies during the Civil War. In fact to such an extent was it employed in the Confederate service that it was recommended by the medical purveyors to be used whenever a warm, aromatic, mucilaginous tea was required, in cases of fever, pneumonia, mumps, etc. The nurses detailed for each company were instructed to procure a supply of the root from the surrounding territory wherever the company or regiment was stationed. In the camps sassafras tea was made and drank daily by both officers and men as a substitute for green tea, as it was thought to purify the blood, and as the latter was difficult to obtain.

Both the American Homeopathic Pharmacopœia and the American Institute of Homeopathy recognize the bark of sassafras root, and make preparations from it. The former makes a 10 per cent. tincture by macerating a certain quantity of the powdered root bark with 5 times its weight of alcohol in a closed vessel for a period of 8 days in a cool dark place, shaking the mixture twice daily; straining off the tincture and filtering after 3 days. The latter also prepares a tincture after a somewhat different plan as follows: 100 Gm. of sassafras are percolated with a mixture of 200 cc. of distilled water and 814 cc. of stronger alcohol to make 1000cc. From these "mother tinctures" the various decimal and centesimal dilutions, medications and triturations are made in the manner prescribed in homeopathic pharmacy. The drug is highly esteemed by the practitioners of this school and is used in a large variety of complaints.

The Pith and its uses.

The pith or medulla is also official and occurs in the form of slender cylindrical pieces, sometimes curved and twisted. It is very light and spongy; white in color, and possessess a mucilaginous taste which only in a slight degree resembles that characteristic of the bark. It is devoid of odor. The pith abounds in gummy material which is readily extracted with water, forming a limpid mucilage, which while it is viscid and ropy, does not possess the tenacity of mucilage of acacia. On this account it cannot be employed as a substitute for acacia in the suspension of insoluble substances. It differs from ordinary solutions of gum in that the addition of alcohol doses not cause a precipitate to appear, the mucilage remaining limpid. This mucilage is highly prized and much employed as a soothing application in inflammatory conditions of the eye. It is also administered in dysenteric, catarrhal, and nephritic affections. For the latter purpose it is prepared by adding a dram of the pith to a pint of boiling water, macerating several hours and straining.

The pith and dried leaves of the young branches of the sassafras are used in the neighborhood of New Orleans to thicken soups, and the pith is a constituent of the celebrated "Gumbo soup" of the Creoles.

The U. S. Pharmacopœia recognizes the mucilage and directs its preparation as follows:

> Formula: Sassafras pith........... 2 Gm.
> Water ....100 cc.
>
> "Macerate the sassafras pith in the water during 3 hours and strain. Make fresh when wanted."

This formula has been subjected to much criticism. The use of water as the term is usually accepted is not permissible in any case where the mucilage is to be used in application to inflamed eyes. Sterilized water alone should be employed. Oculists find much fault with the official formula on account of the failure to specify sterilized or distilled water. Three hours time is far too long to spend in making the preparation when the same object can be accomplished in a much shorter time.

England (Am. Jour. Phar. 91, 350) proposes the following method in place of the official one. Beat the pith in a wedgewood or porcelain mortar with a small quantity of sterilized water until it assumes a pasty consistence. Express through cheese cloth and return residue to mortar. Add more of the water and continue as before. In this way in a short time a dense and syrupy like mucilage may be had, very different in physical appearance from the watery product gotten by following the official directions of simple maceration in water for three hours and straining.

The Oil.

Oil of sassafras is recognized by the U. S. Pharmacopœia and is described as a yellowish or reddish yellow oil having the characteristic odor of sassafras and a warm aromatic taste, with a specific gravity of 1.070 to 1.090 at 15° C. It is obtained from the bark of the root by distillation, about 1 lb. being obtained from 3 bushels of the root. The distiller of the oil has, as a rule, very little scientific knowledge, his work being done empirically. The oil is usually sent into the market in 5 gallon cans; occasionally a consignment is received in which the different cans of the same lot contain an oil of low and high gravity. This is not necessarily due to an adulteration, but may arise from natural causes. This matter has been investigated by La Wall and Pursel (Am. Jour. Pharm. July, 98) who find that the difference in specific gravity is due to the fact that the oil has been allowed to partially congeal and the heavy part remains at the bottom unless mixed. The first distillate obtained is impure and requires rectification. This is accomplished in the usual manner, traces of water being removed by treatment with calcium chloride.

Sassafras oil is used largely as a flavoring agent and is employed in the official process for the preparation of "syrupus sarsaparillæ compositus." It also serves as a cheap perfume for soaps, and in the South it finds employment as an application to wens, for which it is regarded as being a specific. Its physiological properties are similar to those of oil of cloves and other allied oils. In one case a teaspoonful taken internally produced vomiting, collapse, and pronounced stupor with dilation of the pupils.

The Leaves.

The leaves of sassafras are used in some of the Southern States as substitute for gum arabic, flax seed, slippery elm and bené. In Virginia and other Southern States beer was formerly made by boiling the young leaves in water to which a certain quantity of molasses and sugar was added, the whole being left to ferment. This beer was regarded as a wholesome and pleasant drink for summer use. The wood stripped of its bark is very durable and resists the destructive action of worms. It makes excellent post for fences and gates, and bed steads made of it are said never to become infested with bugs. It is, however, rarely employed for this purpose, and is now never found in lumber yards. (Read at the October meeting of the New York College of Pharmacy).

A LARGE THERMOMETER.—An alcohol thermometer, 70 feet in length, is now being put in place at Winchester, Mass. It will be placed in a pit of its own depth and be used for scientific measurements of the earth's temperature. It is constructed on the same principles as smaller instruments. (Sci. Am.)

QUESTION BOX

The object of this department is to furnish our subscribers and their clerks with reliable and tried formulas and to discuss questions relating to practical pharmacy, prescription work, dispensing difficulties, etc.

Requests for information are not acknowledged by mail, and ANONYMOUS COMMUNICATIONS RECEIVE NO ATTENTION; neither do we answer queries in this department from non-subscribers. In this department frequent reference is necessarily made to information published in previous issues of the Era. Copies of these may be obtained at ten cents each.

Queries from Non-Subscribers Not Answered.

(Samuel Kidder, Jr., Bad Axe, Mich.), and (Binney Bros., New York). Read the rules at the head of this department. The Question Box is conducted for the benefit of subscribers and their clerks.

Liquid Peptonoids.

(J. K.) See this journal, June 16, 1898, page 913.

Clock-Work Mechanism for Window Displays.

(J.L.) McGreer & Hicks, No. 84 Market street, Chicago, Ill., manufacture various mechanisms for driving small machinery, figures, etc., used in window displays, and it is quite probable they can make for you the special clockwork you desire. Address them, outlining just the character of the work you wish to have done.

Wiener Putz Kalk.

(A. S.) "Wiener putz kalk" is a German name for Vienna lime, a hydrate of lime containing some magnesia (Hager). It is used as a polish for metallic surfaces, etc., and is also known by Germans as "Wienerkalk," "Wienerpolirmittel," "calcaria Viennense," etc. It is listed by wholesale druggists at 13 to 20 cents per pound, according to quantity.

Printing Outfit and Mimeograph.

(G. S.) The Kelsey Press Co., Meriden, Conn., manufacture small printing presses suitable for printing circulars, postal cards, etc. The mimeograph is manufactured by A. B. Dick Co., Chicago, Ill. Both of these companies will doubtless be glad to send you descriptive circulars upon request. Formulas for making the hectograph or copying pad are given in the following issues of this journal for the current year; February 10, page 212, June 2, page 830, and August 18, page 220.

"Bread Oil."

(D. E. H.) Bakers employ the term "bread oil" to designate an oil used to grease bake pans. For this purpose it is customery to use oleomargarine, lard, or olive oil, or sometimes olive oil or poppy oil of the first pressing. According to Bulletin No. 13, U. S. Department Agriculture ("Food and Food Adulterants") a dealer in Saxony is reported to have been selling an oil under the name of "Patent Bread Oil," which he stated to be American palm oil. Upon analysis it proved to be a mineral oil, such as is commonly used as a lubricant. In three cases, it is reported, a large number of persons were made severely ill by the consumption of bakers' goods prepared with this oil, which is wholly indigestible.

Syrup of Terebene.

(W. S.) The following formula has been published, although an ideal syrup containing terebene cannot be made owing to its sparing solubility in aqueous mixtures.

Terebene	1 fl. dram
Powdered acacia	4 drams
Peppermint water	1½ fl. ounces
Syrup tolu, to make	6 fl. ounces

Make an emulsion of the terebene, acacia and 6 fl. drams of the peppermint water, then add the balance of the water, and finally the syrup. Some years ago J. W. England (Am. Journ. Pharm. June, 1898), recommended for the internal administration of terebene a preparation made by admixing the terebene with an equal volume of olive oil, emulsifying with powdered acacia, sugar and water, and flavoring with oil of gaultheria; each teaspoonful to contain 5 mimims of terebene.

Formularies.

(W. T. W.) Besides the Era Formulary, which you now have, the following may be mentioned: Griffiths' "Non-Secret Formulas," $5; Mac Ewan's "Pharmaceutical Formulas" (published by Chemist & Druggist, London), 8 shillings; Ebert and Hiss' "Standard Formulary," $4. For technical formulas and processes you may profitably consult Spon's "Workshop Receipts," 5 volumes, $2 per volume; "Scientific American Cyclopedia of Receipts," $5; Cooley's "Cyclopœdia of Practical Receipts," 2 volumes, $9 (for both) and Dick's "Encyclopedia of Practical Receipts and Processes," $5. In German are the valuable manuals of Dieterich and Hager. You can also find handbooks of processes and formulas along almost any special line of work as perfumery, soda water formulas, manufacture of ink, leather manufacture, liquors, paints, oils and varnishes, paper making, pyrotechnics, metal working, electro-metallurgy, etc., etc.

Liquor Ferri et Mangani Peptonatis.

(J. K.) The following is taken from the Cincinnati Academy of Pharmacy Formulary:

Manganese peptonate	100 grams
Iron peptonate	150 grams
Glycerin	50 C. c.
Spirit of cinnamon	20 C. c.
Aromatic spirit	50 C. c.
Distilled water, a sufficient quantity to make	1000 C. c.

Dissolve the salts in the glycerin and 650 c. c. of water. Add the aromatic spirit and sufficient water to make 1,000 c. c. Filter. This solution represents about one-third of one per cent. of manganese and one-half per cent. of peptonate of iron. Each fluid dram contains about 6 grains of peptonate of manganese and 9 grains of peptonate of iron.

A formula recommended by the Berlin Apothecaries' Society may be found in this journal December 23, 1897, page 956. See also issue of August 26, 1897, page 272.

Varnish for Linoleum.

(C. W. B.) The following has been recommended:

Yellow wax	5 ounces
Oil turpentine	11 ounces
Amber varnish	5 ounces

Melt the wax, add the oil, and then the varnish. Apply with a rag.

A dressing recommended for brightening the appearance of linoleum consists of a weak solution of beeswax in spirits of turpentine. Another formula is:

Palm oil	1 ounce
Paraffin	18 ounces
Kerosene	4 ounces

Melt the paraffin and oil, remove from the fire and incorporate the kerosene.

Polish for Linoleum.

Yellow wax	1 ounce
Carnauba wax	2 ounces
Oil turpentine	10 ounces
Benzine	10 ounces

Melt the waxes carefully, add the oil and benzine, and stir until cold.

Compound Syrup of White Pine.

(W. T. C.) A good "working" formula for a preparation of the above character is given in the National Formulary (Formula No. 386). See also formulas in this journal March 25 and April 1 issues of last year, pages 363 and 393 respectively. Here is another one from Griffiths' "Non-Secret Formulas:"

First make a tincture of white pine and balm of gilead. Then take

Tinc. of white pine and balm of gilead	2 pints
Rock candy syrup	7 gallons
Syrup wild cherry	1 gallon
Chloroform	5¼ fl. ounces
Acetate of morphia	320 grains
Tincture of blood root	10 ounces
Oil sassafras	30 minims
Oil bitter almonds	60 minims
Oil cloves	60 minims
Alcohol, 188 per cent	1 gallon
Tartar emetic	320 grains
Ammonium muriate	8 ounces
Caramel	8 ounces
Water, q. s., to measure	10 gallons

Add the tincture of white pine and balm of gilead, tincture of bloodroot and caramel to the syrups and mix well; then add the oils and the chloroform dissolved in the alcohol. Dissolve the morphine acetate, tartar emetic and ammonium muriate in the remainder of the water and mix thoroughly with the syrup and strain. Adult dose, one teaspoonful.

Shampoo Mixtures.

(Quinine) Various formulas have been published in this journal for shampoo mixtures. Here are some others:

(1)	Soft soap	1	ounce
	Solution potassa	1	ounce
	Rectified spirit	2	ounces
	Perfume	Sufficient.	
	Water, enough to make	1	pint
(2)	Water of ammonia	1	ounce
	Cologne water	1	ounce
	Soft soap	4	drams
	Rectified spirit	6	ounces
	Water, enough to make	1	pint

Dissolve the soap in the spirit, add the rest of the ingredients, and filter.

(3)	Potassium carbonate	1	ounce
	Water of ammonia	2	ounces
	Tincture cantharides	1	ounce
	Tincture capsicum	½	ounce
	Rectified spirit	10	ounces
	Water, enough to make	3	pints

Dissolve, mix and perfume.

Shampoo Powder.

Dried sodium carbonate	1½ drams
Dried curd soap	1½ drams
Solution of orange, sufficient to color.	

Use with a pint of warm water.

Sassaparilla Compound.

(R. B. H.) Try the following formula:

Sarsaparilla	12 troy ounces
Yellow dock	12 troy ounces
Stillingia	6 troy ounces
Prickly ash	2 troy ounces
Poke root	2 troy ounces
Red clover	3 troy ounces
Senna	3 troy ounces
Cascara sagrada	3 troy ounces
Oil sassafras,	
Oil wintergreen,	
Oil anise, of each	5 minims
Potassium iodide	6 2-5 troy ounces
Mercuric iodide	20½ grains
Ferrous iodide	100 grains
Glycerin	12 fl. ounces
Alcohol,	
Water, of each, a sufficient quantity.	

Reduce the crude drugs to No. 30 powder. Mix the glycerin with 36 fluid ounces of alcohol and 72 fluid ounces of water, and having moistened the powder with the menstruum, pack it firmly in a percolator; then add enough more of the menstruum to saturate the powder and leave a stratum above it. When the liquid begins to drop from the percolator, close the lower orifice and macerate in the usual manner for 48 hours. Then allow the percolation to proceed, gradually adding first the remainder of the menstruum and afterwards enough of a mixture of alcohol and water, made in the proportion of 3 parts of alcohol to 6 parts (by volume) of water, until 1 gallon of percolate or extract is obtained. In this dissolve the salts and add the essential oils previously dissolved in a little alcohol. Each fluidram of the finished product contains about 3 grains potassium iodide, 1-50 grain mercuric iodide and 1-10 grain ferrous iodide.

Laxative Syrup of Figs.

(A. D. S.) A syrup containing figs and true to name may be made by the following formula:

Figs, chopped fine	8 ounces
Dates, seedless, chopped	4 ounces
Senna, cut	8 ounces
Frangula, cut	8 ounces
Cascara sagrada, cut	8 ounces
Sodium and potassium tartrate	4 ounces
Sodium bicarbonate	1 ounce
Sugar	96 ounces
Oil clove	20 minims
Oil peppermint	15 minims
Oil anise	15 minims
Oil gaultheria	10 minims
Alcohol	20 fl. ounces
Water, enough to make	1 gallon

With hot water and crude drugs make a decoction which shall, when strained, measure 45 fluid ounces. In this dissolve the salts and the sugar. Dissolve the oils in the alcohol, incorporate with the preceding, and finally add enough water to bring up to the measure of one gallon.

While figs really enter into the composition of the above syrup it does not appear to possess any advantages over the compound syrup of senna of the National Formulary. A formula similar to the last named is this one:

Senna	2 troy ounces
Frangula	128 grains
Rhubarb	256 grains
Jalap	384 grains
Cinnamon	30 grains
Cloves	30 grains
Nutmeg	15 grains
Oil peppermint	5 minims
Sugar	8 troy ounces
Alcohol, 50 p. c., enough to make	16 fl. ounces

Reduce the drugs to a No. 50 powder, add the oil of peppermint and percolate in the usual manner with dilute alcohol. Remove the first 8 fluid ounces of the percolate and dissolve in it the sugar, with the aid of a gentle heat if necessary, but avoiding loss of alcohol by evaporation. Allow the solution to cool, collect a further portion of percolate and add it to the syrup so as to make 16 fluid ounces.

Mary Stuart Boquet.

(H. P. T.) We cannot give the formula for the proprietary article. Under the above title "Pharmaceutical Formulas" (London) publishes the following:

(1)	Oil bergamot	2	ounces
	Extract rose	16	ounces
	Extract jasmine	6	ounces
	Essence musk (1 dr. to 16 ozs.)	4	ounces
	Essence ambergris (1 dr. to 16 ozs.)	2	ounces
	Essence vanilla (6 dr. to 16 ozs.)	4	ounces
	Tincture orris (1 in 2)	8	ounces
	Rectified spirit	64	ounces
(2)	Otto of rose	½	dram
	Oil of sandalwood	½	dram
	Oil of bergamot	1	dram
	Oil of neroli	2	drams
	Tincture of benzoin	4	ounces
	Tincture of orris	4	ounces
	Tincture of Tonka bean	4	ounces
	Essence of civet	4	ounces
	Spirit of rose	4	ounces
	Cassie extrait	4	ounces
	Jasmine extrait	4	ounces
	Rose extrait	4	ounces
	Violet extrait	4	ounces
	Essence of musk	1	ounce
	Essence of ambergris	2	ounces

Mix.

Another formula is:

(3)	Otto of rose	½	dram
	Oil sandalwood	10	drops
	Oil bergamot	1	dram
	Tincture orris	8	ounces
	Tincture vanillin	2	ounces
	Tincture civet	2	ounces
	Tincture musc baur	2	ounces
	Cologne spirit	6	ounces
	Rose water	14	ounces
	Magnesium carbonate	2	ounces

Mix the oils and tinctures with 4 ounces cologne spirit; place the magnesium carbonate in a mortar; pour on the solution of oils and triturate well; take the remaining 2 ounces cologne spirit, mix with rose water, and slowly add to the contents of the mortar, stirring constantly and uniformly for 10 minutes. Filter through paper at as low a temperature as possible. If the weather is warm filter in an ice chest at a temperature of about 40° F. The product should measure about 2 pints. This is said to produce a satisfactory cheap handkerchief extract.

Source and Uses of Mica.

(A. H. B.) The States producing mica are North Carolina, Idaho, New Hampshire, South Dakota, Virginia and Wyoming. According to statistics furnished by the director of the U. S. Geological Survey (Mineral Resources of the U. S., 1896-7, part 5), the value of the domestic production since and including 1885 has averaged $86,000 annually. The most formidable competitor of the industry in this country is furnished by the supply from India. The importation of India mica began in 1884. The value of mica imported between the years from 1884 to 1896 averaged $112,072, as compared with $4,657 for the preceding fifteen years. According to the report above named the condition of the industry of the mines in North Carolina, the principal source of supply, has not been one to encourage the investment of large capital for the introduction of modern methods. Chief among the obstacles to large investment is the general uncertainty as to the character of the deposits. Mica occurs in pockets, some of which are very rich, while work may be carried on under promising prospects for weeks or months without finding merchantable mica. It is said that it is doubtful if the mica mined in North Carolina has paid for the daily wages for the labor spent upon it. Other States that those above named in which mica deposits have been worked, or may be worked in the future, from which no production was reported in 1896, are, Alabama, Connecticut, Georgia, Kentucky, Maine, Massachusetts, Minnesota, Nevada, New Mexico, Pennsylvania and Rhode Island.

The greater part of the cut or sheet mica produced is used by stove manufacturers. The remainder goes into the manufacture of electrical dynamos, for which its nonconductive properties, when free from iron, render it very valuable. Ingenuity has developed a method of using also the smaller sizes of mica for electrical purposes, and some demand has been created for them. Heretofore they went to the scrap pile and were either wasted or ground. The final scrap or waste from cutting is ground for the manufacture of lubricants, for giving a crystal effect to wall papers, and for other decorative purposes. A new use for scrap mica is reported by H. C. Mitchell, in a paper read before the Ontario Mining Institute April, 1897. On account of its infusibility, except at very high temperatures, and its nonconductive properties, Mr. Mitchell recommends it as the principal ingredient for boiler and steam-pipe covering, supplementing his recommendations with a report of results of trials made with such a compound. Some of the trials were made on railway locomotives when subjected to constant and heavy vibrations, and after two years' trial the material was found to be in perfect condition. Mr. Mitchell also suggests the use of mica waste for fireproofing, and for insulating cold-storage chambers, and it is possible that mica waste may be be found an excellent substitute for asbestos for these purposes .

PHARMACY.

TOOTH SOAP.—In Nouv. Rem. the following formula is recommended: Thymol 25 p. and extract of rhatany 100 p. are dissolved in 600 p. of warm glycerin and the solution mixed with 100 p. of spirit of peppermint, 400 p. of borax and 50 p. of burnt magnesia. This mixture is then incorporated with 1750 p. of medicinal oil soap. (Drog. Ztg.)

REACTION FOR ACETYLENE GAS.—To test acetylene lamps or other acetylene containers for leaks, the use of a flame is generally recommended, which, however, is rather dangerous. A simple means of detecting a leakage of the gas is the application to the suspected spot of a strip of paper saturated with lead acetate. The slightest trace of acetylene blackens the paper. It is prepared by saturating unsized paper with a 10 per cent. solution of lead acetate and drying. (Ztsch. f. Ph.)

EXAMINATION OF DERMATOL.—0.5 Gm. of the sample is dissolved in 10 Cc. of diluted hydrochloric acid, the solution is treated with sulphuretted hydrogen and the separated bismuth sulphide removed by filtration. A few drops of ferric chloric solution are added, which should not cause darkening of color. Free Gallic acid is detected by shaking the dermatol with alcohol. The filtrate should leave no residue on evaporation. (Ztsch. f. Ph.)

SYRUPS OF CHLORHYDROPHOSPHATE OF CALCIUM AND GUAIACOL.—The Ph. Post gives the following method of preparation: Make a solution of 60 p. calcium phosphate in 120 p. distilled water, with aid of 70 p. hydrochloric acid. Dissolve 15 p. tolu balsam in 75 p. alcohol and 75 p. distilled water. Make a third solution of 10 p. guaiacol in a mixture of 150 p. glycerine, 90 p. simple syrup, 30 p. arrac, and 60 p. Malaga wine. Mix the three solutions, let the mixture stand 5 to 6 days and filter.

TOXIC EFFECTS OF PURE WATER AND ITS OCCURRENCE IN NATURE are discussed by Dr. H. Koeppe in D. Med. Woch. By chemically pure water, distilled water is ordinarily understood. This has shown itself to be a dangerous protoplasmic poison, in that it withdraws salts from the tissue, causing its distension and depriving it of the ability to retain the salts and other soluble substances necessary to life and thus permitting them to diffuse into the water. This local poisonous effect takes place also in the stomach after drinking distilled water. It manifests itself by nausea, vomiting and catarrh of the stomach. The detrimental effect of irrigating the stomach with distilled water is well known. Pure water in the strict meaning of the word is, however, seldom used, as even freshly prepared distilled water is not an absolutely pure water. The purity of water may be determined by its powers of conducting the electric current. While the purest water obtained by artificial means shows a conductivity of 0.0425, water from melted natural ice had a conductivity of 8.0, and commercial distilled water 49.2. These figures indicate that ordinary distilled water is far from absolute purity. It is a remarkable fact that water is found in nature, which excels ordinary distilled water in purity and is frequently used for drinking purposes. The unpleasant effects from swallowing ice, as vomiting, catarrh, etc., which have frequently been ascribed to the presence of bacteria in natural ice, may thus be explained in part by the toxic action of pure water. The conductivity of a well-water in Gastein, which is considered poisonous ("poison-well"), was found to be 31.9, showing it to contain less dissolved matter than ordinary distilled water. No known poison has ever been detected in this water. The toxic action must therefore be ascribed to the extreme purity of the water. (Ap. Ztg.)

LIGHT FROM SUGAR.—"There are phenomena attending the formation of crystals which are apparently quite distinct from chemical action," says The Lancet (Literary Digest.) "When, for example, a hot saturated solution of arsenious acid is allowed to cool the act of crystallization is accompanied by a flash of light. As each crystal forms there is a short, sharp glow, indicating the release of a certain amount of latent energy in the form of light radiation. A related phenomenon would seem to be the case when two pieces of cane-sugar are quickly rubbed together. The flash is perfectly distinct and bluish-white in color, the light extending into the substance itself far below the surface. Some interesting experiments on this manifestation have recently been made by Mr. John Burke, M. A., the results of which were communicated to the recent meeting of the British Association of Science at Bristol. By mounting disks of loaf-sugar on a lathe and projecting a hammer on the rotating surface an almost continuous luminosity was obtained. The wearing away of the sugar is compensated for by arranging a gradual approach of the piece to the hammer in exact accordance with the amount of sugar scraped away. In this way the spectum has been observed and photographed. From these observations it would appear that the luminosity can not be due to the particles of sugar becoming red-hot or white-hot by the impacts, the indication being that the light produced is due either to some change in the configuration of the crystals of sugar or to some sort of chemical action set up between the sugar and the surrounding air at the freshly formed surface. The fact, however, that the surrounding medium does not seem to affect either the color or intensity of the luminosity suggests that the effect is not due to any influence of a chemical nature of the surrounding medium on the sugar, but favors the former hypothesis that the luminosity is due to some structural disturbance in the sugar itself. This ingenious and pretty study is being pursued further, and the results should lead to some interesting observations. Light is so often a manifestation of physical change that it is probable some day we shall derive it for illuminating purposes in a totally different, much simpler, and less clumsy way than obtains at present."

The Era Course in Pharmacy

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THE ERA COURSE IN PHARMACY is a thorough, practical and economical course of home study in pharmacy, and covers the subjects usually embraced in the curriculum in a standard college of pharmacy. It is designed for all who desire systematic instruction in pharmacy; for clerks who cannot attend college; for those preparing for pharmacy board examinations; as auxiliary course for students in college, and as a means of review for graduates and experienced pharmacists.

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FEES. The entire expense is only $7.75 per annum and includes subscription to the ERA, tuition fees and a binder for preserving copies and lectures.

LECTURE NO. 19.

Inorganic Chemistry.

The Halogens.—(*Concluded.*)

Chlorin Trioxid, or Chlorous Anhydrid, Cl_2O_3.—Chlorin trioxid is prepared by the reduction of chloric acid, $HClO_3$, obtained from chlorates. It is a greenish yellow gas, with an odor resembling, but more irritating and corrosive than, pure chlorin. It can be condensed by cold and pressure to a reddish brown liquid, very unstable and explosive. Chlorin trioxid dissolves in water to form chlorous acid.

$$Cl_2O_3 + H_2O = 2HClO_2.$$

Like the hypochlorites, the chlorites are unstable, and are liable to explode when rubbed with easily oxidizable substances.

Chlorin Dioxid or Peroxid, ClO_2.—A heavy, dark yellow, highly explosive gas, prepared by the action of concentrated sulfuric acid upon potassium chlorate. In the reaction chloric acid, $HClO_3$, is first liberated, and then splits up into perchloric acid, $HClO_4$, chlorin peroxid and water, and probably other products. There is no acid corresponding to this oxid.

Chloric Acid, $HClO_3$, and Perchloric Acid, $HClO_4$.—When chlorin is passed into a hot or concentrated solution of an alkaline hydrate, a mixture of chlorate and chlorid is produced.

$$6Cl + 6KOH = KClO_3 + 5KCl + 3H_2O.$$

The chlorate is separated out by crystallization and chloric acid may be prepared from this by the action of dilute sulfuric acid.

When potassium chlorate is heated to a certain point it fuses, gives off oxygen and is converted into a mixture of potassium perchlorate and chlorid.

$$2KClO_3 = KClO_4 + KCl + O_2.$$

The perchlorate may be separated from the chlorid by its lesser solubility, and perchloric acid prepared from it by the action of sulfuric acid, thus:

$$2KClO_4 + H_2SO_4 = K_2SO_4 + 2HClO_4.$$

Because of the readiness with which they decompose and yield up their oxygen, chloric and perchloric acids are oxidizing agents of great force, instantly setting fire to such substances as shavings, cork, paper, etc., the reaction occurring with explosive violence if the quantities be large. For a similar reason the chlorates and perchlorates are dangerous when triturated with combustible bodies. A number of grave accidents have resulted from the careless grinding of potassium chlorate in a mortar with oxidizable substances. When such substances are to be combined, they should be mixed on a sheet of paper, without friction, and should not be stored for any length of time.

Chlorin Pentoxid, Cl_2O_5, corresponding to chloric acid, and the heptoxid, Cl_2O_7, corresponding to perchloric acid in which chlorin would have a valence of seven, have never yet been prepared in the free state.

PRACTICAL STUDIES.

7. Place several small crystals of potassium chlorate in a test tube, add enough water to cover the crystals, and one or two Cc. hydrochloric acid, warm. What occurs? Test the evolved gas with calico, as in the second experiment.

8. Put one or two *small* crystals of potassium chlorate in a dry test tube. Take the tube in a holder, turn the mouth of the tube away from every one present and add a few drops of undiluted sulfuric acid. Still holding the tube in the manner described, warm it gently. What occurs? What compounds are probably formed?

9. Powder a few grains of potassium chlorate, mix it with an equal bulk of powdered sulfur, wrap the mixture in a small piece of paper, lay the package on a piece of iron and strike it a sharp blow with a hammer. What would probably result from an attempt to powder potassium chlorate and sulfur together in a mortar?

BROMIN.

Symbol Br. Valence, 1, 3, 5. Atomic Weight, 79.76.
Vapor Density, 79.76. Specific Gravity, 2.99.

Historical.—Bromin was discovered in the bittern of salt works by Balard, of Montpellier, France, in the year 1826. The name is derived from the Greek *bromos*, a stench, in allusion to its powerful and disagreeable odor.

Natural Sources.—Bromin occurs combined with metals as bromids, principally of sodium, potassium and magnesium, in sea waters and in salt beds. The principal commercial source is the *bittern* or residual brine of salt works, and is largely produced in the States of Ohio, Pennsylvania and West Virginia.

Preparation.—The element is prepared from its bromids by treating them with oxidizing agents, as chlorin, nitric acid, or manganese dioxid and sulfuric acid, and distilling.

Description and Physical Properties.—Bromin at ordinary temperatures is a heavy, mobile, dark brown or red liquid, evolving orange-red vapors when exposed to the air, and possessing a strong, penetrating and unpleasant odor. The vapors are suffocating and poisonous.

Bromin is the only element, except mercury, which is a liquid at ordinary temperatures. It is nearly three times as heavy as water (S. G. 2.99 at 15° C.), freezes at −7.2° C. and boils at about 60° C. It is soluble in about 30 parts of water, forming a brownish-yellow solution from which at 0° C. a crystalline hydrate, having the composition $Br_2 + 10H_2O$, separates out. Like the corresponding chlorin hydrate, this compound gradually decomposes into the free element and water. Bromin is freely soluble in alcohol, ether, chloroform and carbon disulfid, forming orange-red solutions.

Chemical Properties.—Bromin is a very active element, though less so than chlorin, and combines readily with many other elements to form bromids. A singular exception is found in the case of metallic sodium with which it may be boiled with only a slight reaction, while with metallic potassium it combines violently.

Its bleaching and oxidizing effects upon organic coloring matter are similar to but less marked than those of chlorin. Its aqueous solution, known as bromin water, gradually becomes colorless, the bromin combining with the hydrogen to form hydrobromic acid, and releasing the oxygen.

Compounds of Bromin.

Bromin combines with hydrogen to form Hydrobromic Acid, HBr. Like chlorin, it does not combine directly with oxygen, but does so indirectly, forming two acids, hypobromous, HBrO, and bromic, $HBrO_3$. No free oxids of the element have yet been prepared.

Hydrobromic Acid, HBr.—Hydrobromic acid is a colorless gas resembling hydrochloric acid in smell and chemical properties. An aqueous solution of the acid may be prepared by the action of a reducing agent such as phosphorus or hydrogen sulfid, on bromin, in the presence of water. A ten per cent. solution of the gas constitutes the official Diluted Hydrobromic Acid.

Like the chlorids, nearly all the bromids are soluble in water except silver mercurous and lead bromids, the last being sparingly soluble.

The bromids are recognized by the characteristic properties of the bromin when released by oxidizing agents, such as chlorin, nitric acid or by manganese dioxid in presence of sulfuric acid. Free bromin colors chloroform, ether or carbon disulfid brownish red when shaken with them. It colors starch solution yellow.

Hypobromous Acid, HBrO.—Hypobromous acid and the hypobromites are prepared exactly as hypochlorous acid and the hypochlorites, and have similar properties.

Bromic Acid, $HBrO_3$.—When bromin is added to a concentrated solution of an alkaline hydrate a mixture of bromid and bromate is formed.

$$6Br + 6KOH = KBrO_3 + 5KBr + 3H_2O.$$

The bromate being the less soluble salt, is easily separated out by crystallization. The free acid may be obtained by first making silver bromate from the alkaline bromate and then decomposing the silver salt with hydrochloric acid. Bromic Acid and its salts closely resemble the corresponding compounds of chlorin.

The existence of Perbromic Acid, $HBrO_4$, is disputed.

Characteristic Reactions.—The salts of the oxygen acids of bromin are identified by releasing their bromin by means of reducing agents, as hydrochloric and sulfurous acids, and dissolving the freed bromin by means of carbon disulfid or starch paste.

PRACTICAL STUDIES.

1. Prepare free bromin by treating a small crystal of potassium bromid with concentrated sulfuric acid and heating. Hydrobromic acid is first set free and then decomposes, yielding brown-red vapors of bromin. Test the vapors with colored calico, as was done with chlorin. Avoid inhaling the fumes.

2. Prepare a solution of hydrobromic acid by placing in a small flask or test tube about a gram of red phosphorus, covering with water, and then adding gradually an equal volume of bromin water. If necessary, warm until the mixture becomes colorless. Pour off the clear solution and test as in the next experiment.

3. Add a solution of hydrobromic acid, or a solution of a bromid (e. g., potassium bromid) to solutions of silver nitrate, lead acetate, and mercurous nitrate. What occurs? How do the results compare with the corresponding experiment under hydrochloric acid? Represent the reactions by equations.

4. To a solution of a bromid add a few drops of nitric acid, heat until it becomes colored, *cool*, and add some carbon disulfid or chloroform. Agitate thoroughly, and note the color of the heavier liquid. Repeat the experiment, using starch paste instead of carbon disulfid or chloroform.

IODIN.

Symbol I. Valence, 1, 3, 5. Atomic Weight, 126.53.
Vapor Density, 126.53. Specific Gravity, 4.95.

Historical.—Iodin was discovered in 1811 by Courtois, a Parisian soap boiler, who found it in kelp liquor. Its properties were determined mainly through the studies of Sir Humphrey Davy and Gay Lussac. The latter chemist proposed the name iodine from the Greek *iodes*, violet colored, because of the splendid violet color of its vapors.

Natural Source.—Iodin is associated in nature with chlorin and bromin as iodids of the alkalies, in sea water, salt springs and in sea plants, and, like these related elements, is released from combination by the action of oxidizing agents.

Preparation.—The iodin of commerce is obtained largely from *kelp*, the name given to the ash made from sea weeds thrown up by storms on the North Atlantic coasts. The ash is lixiviated, and the resulting lye partially freed from accompanying carbonates, chlorids and sulfates by concentration and fractional crystallization. The residual brine is treated with sulfuric acid and manganese dioxid, and the released iodin distilled off.

$$2NaI + MnO_2 + 3H_2SO_4 = I_2 + 2NaHSO_4 + MnSO_4 + 2H_2O.$$

The most important present source is in the nitre beds of Chili and Peru. It exists in these as sodium iodate, from which it is obtained by the aid of reducing agents, as sulfurous acid, or its acid salts.

Description and Physical Properties.—At common temperatures Iodin is a bright, shining, crystalline solid, of a steel gray color and metallic lustre, having a pungent odor resembling the odors of chlorin and bromin, but fainter.

The specific gravity of solid iodin is 4.948 at 17° C. Heated in the air it yields splendid violet colored vapors, which in the absence of air are deep blue. It is soluble in about 5,000 parts of water and freely soluble in alcohol, ether, carbon disulfid, and similar solvents. It also dissolves freely in a solution of potassium iodid. With carbon disulfid or chloroform it forms a red to violet solution according to concentration. With starch paste it yields a fine deep blue, which disappears on warming and reappears on cooling.

Chemical Properties.—In chemical properties, iodin is the least active of the halogens. Like the others it bleaches organic matter, and corrodes the metals, but with much less energy. It combines with hydrogen, but not so readily as the three preceding elements, since it is not able to decompose water, either in the dark or the light. Like bromin, it reacts with explosive violence with potassium, but has but little effect on sodium, even when heated with it.

Compounds.

Iodin forms one compound with hydrogen, Hydriodic Acid, HI, and two oxygen acids, Iodic and Periodic.

Hydriodic Acid, HI.—Hydriodic acid is a heavy, colorless gas, fuming in moist air, and resembling hydrochloric and hydrobromic acids in many of its properties. It may be prepared in solution like hydrobromic acid by the reducing action of phosphorus or hydrogen sulfid upon iodin in the presence of water, the gaseous acid being very soluble in that liquid.

The iodids of the metals are generally soluble, except those of silver, mercury and lead, the latter being sparingly soluble. Iodin is released from iodids by the same oxidizing agents as are used to set free chlorin and bromin from their chlorids and bromids.

The iodids are used in medicine as alteratives, and are largely consumed in photography and in the arts.

The iodids are identified by setting free their iodin by means of an oxidizing agent, and testing the released element with carbon disulfid or starch paste.

Iodin and Oxygen.—Only one oxid of iodin, the pentoxid, I_2O_5, is known to exist. This is the anhydrid of iodic acid, HIO_3, which it yields when dissolved in water.

$$I_2O_5 + H_2O = 2HIO_3.$$

Iodin when dissolved in alkali yields a mixture of iodid and iodate, as follows:

$$6I + 6KOH = KIO_3 + 5KI + 3H_2O.$$

Iodic acid can be obtained from the iodate by decomposing the latter with an acid. The pure acid is in the form of colorless, rhombic crystals, which on heating decompose again into the anhydrid and water.

$$2HIO_3 \text{ (heated)} = I_2O_5 + H_2O.$$

Iodates may be further oxidized to Periodates, as KIO_4, the salts of an acid corresponding to an hypothetical anhydrid, I_2O_7, in which iodin is septivalent. The iodates in general resemble the corresponding chlorin and bromin compounds.

Iodin when present in any of its oxygen compounds is detected by being first released by reducing agents, such as SO_2 or H_2S, and testing in the usual manner, with carbon disulfid or starch paste.

PRACTICAL STUDIES.

1. In a clean, dry flask, or in a large test tube, place a few small crystals of iodin and heat until the evolved vapors fill the vessel. As the vapor disappears, what is found on the cooler portions of the glass?

2. Make some starch paste in the following manner: Mix, thoroughly, 0.5 Gm. starch with cold water, and add mixture to 25 Cc. of boiling water in an evaporating dish, and continue the boiling, with stirring, until the solution becomes clear. Add a few drops of this starch paste to a test tube about one-third full of cold water slightly colored with a small crystal of iodin and mix. Note the result. Observe the result when the mixture is hot.

3. To an aqueous solution of iodin add two or three Cc. of carbon disulfid or chloroform, and shake thoroughly. What change is effected?

4. In a test tube place 0.5 Gm. of red phosphorus, add about 10 Cc. of water and a small portion of powdered iodin. If reaction does not take place, *warm gently*. Pour or filter off the clear solution and test it for hydriodic acid as follows:

5. Add a small portion to a dilute solution of silver nitrate, lead acetate, and mercurous nitrate, contained in different tubes. Note the results, and write equations to represent the reactions.

6. To the remaining portion of the solution add a few drops of strong nitric acid. If the solution becomes colored divide into two portions. To one portion add carbon disulfid or chloroform and agitate, as in the third experiment.

Add a few drops of the second portion to a tube containing some starch paste, and note the result.

COMPARISON OF THE HALOGENS.

The student will not have failed to notice the parallelism of properties exhibited by the members of this group. For example, all are very active elements, and on this account are rarely, if ever, found in the free state. All are strong oxidizing agents, and destroy the colors of many organic compounds. Each forms a single gaseous acid, the molecule of which contains one atom of hydrogen and one of the halogen. The fluorids, chlorids, bromids, and iodids, and the salts of their corresponding oxygen acids have many properties in common.

In addition to this parallelism we may also notice a remarkable *progression*, or step by step modification of properties in passing from either end of the series to the other, corresponding to the variation in their atomic weights. These weights are F, 19; Cl, 35.4; Br, 79.76; I, 126.53.

1. There is a progressive increase in density, the first being a gas but little heavier than air, the second a gas more than twice as heavy as air, the third a liquid nearly three times as heavy as water, and the last a solid more than four times as heavy as water.

2. There is a corresponding deepening of color, fluorin being nearly colorless, chlorin greenish yellow, bromin orange red, and iodin almost black.

3. There is a reverse progression in chemical activity from the first to the last, fluorin being the most active, and iodin the least active of the family. Bromin can displace iodine from its compounds, chlorin can displace bromin, and fluorin can displace all three.

4. There is a similar reverse progression in their affinity for hydrogen. Fluorin can combine with that element either in the light or in the dark, and decomposes water explosively to obtain its hydrogen. Chlorin can combine with hydrogen only in the light, and decomposes water slowly. Bromin will not combine directly with hydrogen, even in the light, unless with aid of the electric spark, and decomposes water only when exposed to bright sunlight. Iodin can be made to combine with hydrogen directly only with difficulty, and does not decompose water even in sunlight.

5. There is a decrease in non-metallic properties from the first to the last, fluorin being the most decided of non-metals, while iodin has a metallic lustre, and exhibits some marked basic properties.

Many other features of parellelism and progression might be pointed out but the examples given are sufficient to show the remarkable relation existing between the properties of these elements and their atomic weights.

THE DECOMPOSITION OF IODOFORM BY THE ACTION OF LIGHT.—It is well known that light decomposes iodoform solutions, with a separation of iodine. The decomposition is not complete, but limited to a certain point. Fleury says that this point is reached as soon as the solution has become so brown that the ultraviolet rays no longer are transmitted through the external layers of the liquid. To prove this, the author prepared an alcoholic, ethereal iodoform solution and added an excess of silver powder. Light, direct from the sun, and diffused light acting upon the solution, hastened the formation of silver iodide, by binding all the iodide freed. After a few days the solution was filtered and the silver iodide determined. In one gram iodoform all the iodine was set free by this method. This shows that the iodoform was completely decomposed by sunlight, and the liberated iodine, as soon as it was generated, changed to silver iodide.

LECTURE NO. 20.

Pharmaceutical Physics.

Light.

The Nature of Light.—As in the cases of sound and heat, the sensation called light is something quite different from the physical agency which occasions the sensation, and must be carefully distinguished therefrom.

Like sound and heat also, light originates in vibration, but in vibrations of quite different nature from the two former. While sound is due to mass vibration, and heat to molecular vibration, light is believed to be due to vibrations, or wave motions, in a peculiar medium technically known as "the ether," or *light is that vibration of the ether which affects the organ of vision and occasions the sensation of sight.*

Properties of the Ether.—The ether is not evident to any of the senses, nor can it be determined by any of the common tests which may be used to identify matter. Our belief in its existence rests upon deduction from certain observed physical phenomena which cannot be accounted for upon any other ground than by the assumption of such a medium.

This medium is presumed to pervade all space, not only surrounding and enveloping all visible bodies, but penetrating between their molecules and filling the intermolecular spaces as well, or, in other words, ordinary matter is transparent to the ether.

In order to possess the properties required by the theory of light, the ether must be enormously less dense, and much finer grained than any kind of matter we are acquainted with, and almost perfectly elastic and incompressible. Although it surrounds all portions of matter, it permits material bodies to pass through it without evident resistance, and without perceptibly impeding their motions.

Invisibility of Light Waves.—Bodies are seen by the light waves which come from them to the eye, but the light waves are themselves invisible. A beam of light admitted into a darkened room, free from dust, will not be visible except where it strikes the floor or wall. If now a dust be created in the room, the whole pathway of the beam is rendered visible by the illumination of the dust particles.

Definition of Some Common Terms.—Bodies which emit light waves, as the sun, are called *luminous*, while those that merely reflect the waves which fall upon them, as the moon, are said to be *illuminated*.

By a *ray* of light is meant the line of direction along which a light wave is propagated. A *beam* is a volume of light of appreciable diameter, all the rays of which are parallel. A bundle of rays diverging, i. e., spreading from a point, is known as a *pencil*.

A *transparent* substance is one which permits the passage of light waves so that objects may be distinctly seen through it, as glass, or mica. An *opaque* substance is one which does not permit the passage of light waves, as wood or iron. A *translucent* substance is one which permits a partial passage of light waves, as oiled paper, horn, etc.

Path and Velocity of Light Waves.—In a medium of uniform density the path of a light ray is always a straight line from its source. Its velocity through free space, as between the earth and the sun, is computed to be 299,853 Km. per second (something more than 186,000 miles), or a speed sufficient to take it nearly seven and one-half times around the earth at the equator in one second.

When light enters a denser medium its velocity is lessened; when it enters a less dense medium its velocity is increased.

Intensity of Light.—Every point on a luminous body acts as an independent source of light, and emits waves in all directions. Since these waves travel in all directions from their source, it follows that light must progress in the form of a sphere, and that the Law of Inverse Squares will apply, or *that the intensity of light varies inversely as the square of the distance from its source.* In other words, the illumination from a candle at 4. M distance will be only ¼ as much as one at 2. M; from one at 5. M only 1/25 as much as one at 1. M, etc. The reason for this is apparent from an inspection of the figure. (Fig. 53.) The amount of light which illuminates the square at A, is at B spread over four, and at C nine, times as much surface, and its intensity correspondingly diminished.

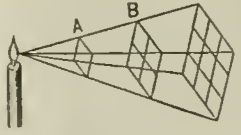

Fig. 53.—Effect of Distance on Intensity of Light.

Shadows.—When an opaque body is placed before a source of light, a shadow is cast upon objects situated beyond the opaque body. (Fig. 54.)

Properly the whole darkened space behind the screen constitutes the shadow, but popularly the term is applied only to the darkened surface upon which the shadow falls.

By observing such a shadow two parts may be distinguished, a central darker portion called the *umbra*, from which all light is excluded, and a surrounding lighter region, the *penumbra*, from which only a portion of the light is intercepted.

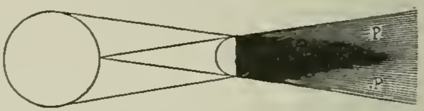

Fig. 54. Umbra and Penumbra.

Images Formed by Small Apertures.—If a lighted candle be held in front of a screen every point of the candle forms its own image upon the screen, with the result that the multitude of images so overlap each other that no one of them is distinguishable. If now there be interposed between the candle and the screen a cardboard with a small aperture in the middle, an inverted image of the candle at once appears upon the screen. (Fig. 55.) No new image is created by the aperture. The action of the interposed card is simply to make one image clear by shutting off all the others. This might be shown by gradually enlarging the hole in the card, when the image on the screen would gradually become less distinct and finally disappear in the general illumination of the surface.

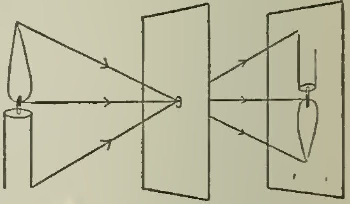

Fig. 55. Image Formed Through Aperture.

The image is inverted because light travels in straight lines. A straight line from the bottom of the candle through the aperture will strike the screen at the top, while a straight line from the top of the candle will reach the screen at the bottom, and so on for every other point of the candle except its middle point.

If the small aperture be in the wall of a darkened chamber, a screen placed in front of it will show an inverted image, in natural colors, of the illuminated objects outside. (Fig. 56.)

A small box with such an aperture in one of its sides constitutes the "pin hole camera," sold as a cheap substitute for the photographic camera with a lens.

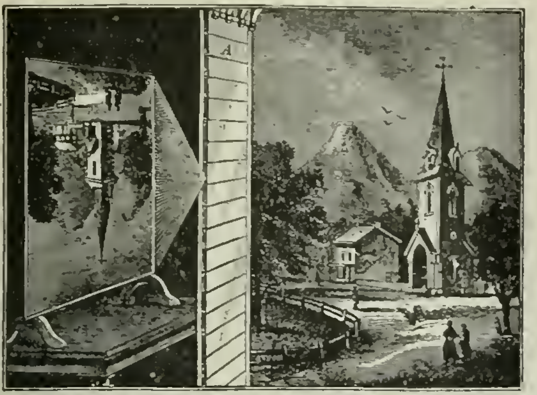

Fig. 56.—Image of Landscape Formed Through Aperture.

Decomposition and Recomposition of White Light.—If a beam of light be introduced into a darkened room and caused to pass through a triangular glass prism, suitably placed, it will be spread out into a colored band known as the *solar spectrum.*

If the colored band be passed through a second prism placed in reversed position, the colored band will be recomposed into a beam of white light. From this decomposition and recomposition we infer that white light is a mixture of all the colors of the spectrum.

That this is the case is confirmed by use of a Newton's Disk, which is simply a circle of cardboard upon which are painted the colors of the spectrum. When the disk is caused to rotate rapidly, the separate colors disappear, and the sensation of white light only is perceived.

The Prismatic Colors.—While the several colors of the spectrum merge into each other through an infinite number of shades, it is usual to distinguish several well marked hues which are known as the *prismatic* or *primary* colors. Beginning at the least refracted portion of the spectrum the colors stand in the following order: Red, orange, yellow, green, cyan blue, ultramarine blue and violet.

Wave Lengths and Vibration Periods of Light Waves.—By appropriate methods it has been shown that the different colors of the spectrum are produced by ether waves of different lengths, those lying at the violet end being produced by the waves of shortest length, and those at the red end by the longest wave lengths. The waves which produce the sensation of dark red are the 760 millionth of a millimeter in length, and occur at the rate of 395 trillions per second. The waves in the violet are the 397 millionth of a millimeter long, and occur at the rate of 760 trillions per second. The intermediate colors are produced by waves of lengths and vibration periods lying between these two limits.

According to Prof. Langley, we are acquainted with ether waves of vibration periods ranging from 107 trillions to 40,000 trillions per second, but our eyes are sensitive only to those which lie between the limits of the dark red and violet given above.

Cause of Color Sensation.—It is evident from what has been stated above that colors have no such objective existence as we commonly attribute to them, but are mere sensations produced by ether waves of varying lengths. Just as the pitch of a sound depends upon the number of sound waves which strike the ear in a second, so color sensation depends upon the number of ether waves which reach the eye in a second. If the number of waves is 395 trilions per second the sensation is dark red, and as the vibration rate increases the color varies until the rate is 760 trillions per second, when the sensation of violet is produced.

Complementary Colors.—Complementary colors are those which when mixed produce the sensation of white—that is, they are the complements of each other. In the circular diagram (Fig. 57) the complementary colors are placed opposite each other. Any two of the opposite colors on being mixed in the right proportions will produce white.

Red mixed with green in varying proportions can be made to produce any color lying between them. So green and violet can be mixed to produce any intermediate color, while violet and red mixed will yield purple. The three colors, red, green and violet, however, cannot be produced by mixing any of the others; hence, according to Young's theory of color vision, these are the three *primary color sensations,* and all other color sensations are combinations of these. Mixed all together in proper proportion the sensation is white, or if any two are mixed the intermediate sensations are produced.

According to this theory, color blindness is due to the absence of one of the primary color sensations, usually red, so that the color blind person is able to distinguish only green and violet and the colors produced by their intermixture.

Color by Absorption. Theory of Pigments.—The color of an object depends upon the relation of the absorbed and reflected rays. If all the rays are equally reflected the sensation of white light is produced and the object is called white. If the waves are largely absorbed and absorbed equally so that there is but little reflection, the object is said to be black. If the red waves are mainly reflected, and the others absorbed the object is called red, and so on. In applying paint, we select the pigment which has the property of reflecting the waves which produce the color sensation desired, and of absorbing the others.

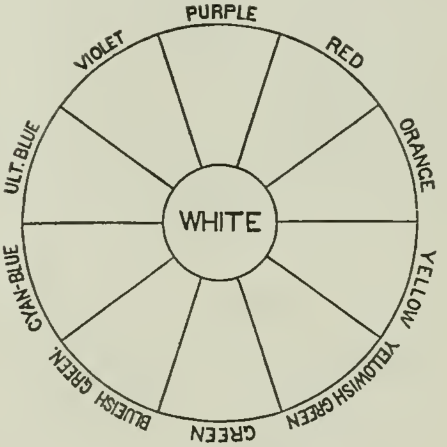

Fig. 57.—Complementary Colors.

It must be noted, however, that mixing colors, and mixing pigments may yield different results. Thus, while blue light and yellow light will combine to form white, blue and yellow pigments mixed will produce green. This is explained by the assumption that the blue pigment absorbs the red, orange and yellow rays, and the yellow pigment the blue and violet. The green rays being absorbed by neither, are reflected, and give their own color to the mixture.

Reflection of Light, Mirrors.—Objects with roughened surfaces diffuse the light which falls upon them, or reflect it irregularly in all directions. If the surface be sufficiently smooth the light is reflected regularly and images are formed. Such reflecting surfaces are known as *mirrors,* and may be constructed of any material which will bear a sufficiently high polish.

When a beam of light strikes a mirror, part of it is absorbed and the remainder reflected according to the general Law of Reflection, which is, *that the angle of reflection is equal to the angle of incidence.*

The angle of incidence is the angle at which the beam of light strikes the reflecting surface, and the angle of reflection, the angle at which it is thrown back. If the light strikes the mirror at a right angle, i. e., perpendicularly, it is, of course, reflected back along the same path.

The intensity of reflected light depends not only upon the nature and polish of the reflecting surface, but also upon the angle of incidence; the more oblique the incident ray the more intense will be the reflection. For example, the light of the sun reflected from the water near sunset is much more brilliant than when the sun is overhead.

According to the shapes of their surfaces, mirrors are either *plane* or *curved.* Curved mirrors may be either concave or convex.

Images Formed by Plane Mirrors.—When an object is held in front of a plane mirror an image is formed which appears to be as far back of the mirror as the object is in front of it. The image is of the same size as the object, but reversed from right to left, so that the right-hand side of the object appears at the left side of the image, and vice versa.

Since the image is not actually back of the mirror where it seems to be, it is known as a *virtual* image, to distinguish it from a *real* image, which really exists at the point where it seems to be located.

Owing to the fact that the image has the same apparent size as the object, it is evident that a plane mirror does not alter the angle of the rays to each other by reflecting them, i. e., rays convergent before reflection will be convergent afterward, divergent rays will remain divergent, etc. With mirrors having curved surfaces the result is quite different.

The Concave Spherical Mirror.—A concave spherical mirror may be regarded as a circular piece cut out of a sphere, with the reflecting surface on the inside. (Fig. 58.) For the purposes of description we may distinguish the following parts: The distance between M and N is the *diameter* or *aperture,* of the mirror. The point V is the *vertex.* The point C is the *center of curvature,* and represents the center of the sphere of which the mirror is supposed to be a part. The straight line drawn through C and V represents the *principal axis.* Any other straight line passing through C is known as a secondary axis, as CA, CB, etc.

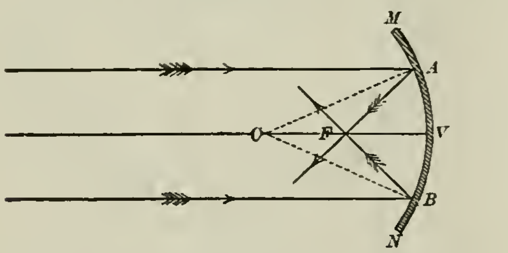

Fig. 58.—Reflection of Parallel Rays by Concave Mirror.

Effect of Concave Mirrors on Light Rays.—Parallel rays, or rays coming from a great distance and practically parallel, will be reflected to a point on the principal axis located about midway between the vertex and center of curvature, and known as the *principal focus.* (Fig. 58.) Conversely, rays originating at the principal focus, and therefore divergent, will be parallel after reflection.

If the rays originate at some point on the principal axis, and therefore divergent when they strike the mirror, they will converge after reflection to some other point also on the principal axis, or if they originate at the latter focus they will converge at the first named point. (Fig. 59.) Two such points, so related that diverging rays from one will converge and meet at the other are known as *conjugate foci.*

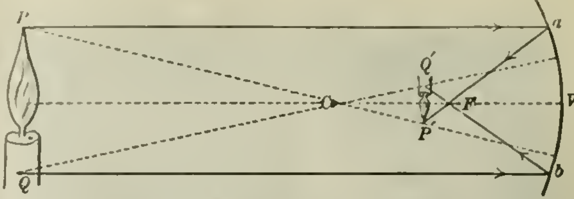

Fig. 59.—Conjugate Foci of Concave Mirror.

From the foregoing it appears that the general effect of a concave mirror is to lessen the divergence and increase the convergence of the light which falls upon it.

Formation of Images by Concave Mirrors.—The position and character of the image formed by a concave mirror depend upon the location of the object. If a candle be placed on the principal axis, *outside* of the center of curvature, a real, inverted image will be formed between the principal focus and the center of curvature. (Fig. 59.) If the object be located between the principal focus and center of curvature, then the image will be real, inverted, larger than the object and located outside of the center of curvature.

If the object be placed between the principal focus and the mirror, the image will be larger than the object, erect, and appear to be located behind the mirror. (Fig. 60.)

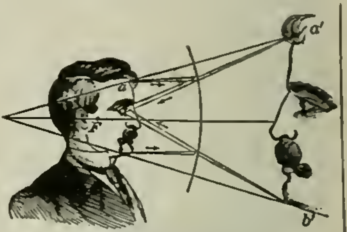

Fig. 60.—Virtual Image In Concave Mirror.

Effect of Convex Mirrors.—The concave mirror reversed becomes the *convex* mirror, and has a reverse effect upon the light rays. Whereas the general effect of the former is to cause a convergence, the latter causes divergence, or *the general effect of a convex mirror is to decrease the convergence and to increase the divergence of light rays.*

Images Formed by Convex Mirrors.—If a candle be placed at PQ in front of a convex mirror, its image will appear to be located at P'Q', behind the mirror. (Fig. 61.) This will be the case no difference how near or how far the candle be from the mirror. Hence, the images formed by a convex mirror are *virtual, erect and smaller than the object.*

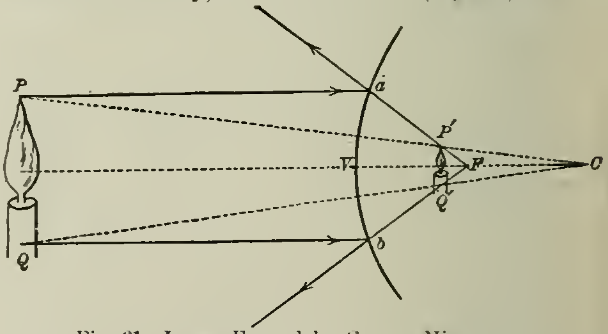

Fig. 61.—Image Formed by Convex Mirror.

PRACTICAL STUDIES.

Prove the invisibility of light by going into a darkened room which has not been used for a time and admit a beam of light through a shutter. Endeavor to see the light by viewing the beam from the side, then create a dust by the shaking of a cloth, and note the illumination of the dust particles.

Study the formation of images through small apertures by making a pinhole in a thin cardboard and holding it in various positions between a lamp or candle and a white wall or other screen.

Hold different objects in front of a plane mirror and note the location and inversion of the images formed.

If any concave or convex reflecting surfaces are available, repeat the last experiment, and compare the results obtained.

THE CENTURY'S PROGRESS IN CHEMISTRY.*

BY HENRY SMITH WILLIAMS, M. D.

I.

Small beginnings have great endings—sometimes. As a case in point, note what came of the small original effort of a self-trained back-country Quaker youth named John Dalton, who along toward the close of the last century became interested in the weather, and was led to construct and use a crude rain-gauge to test the amount of the waterfall. The simple experiments thus inaugurated led to no fewer than two hundred thousand recorded observations regarding the weather, which formed the basis for some of the most epochal discoveries in meteorology, as we have seen. But this was only a beginning. The simple rain-gauge pointed the way to the most important generalization of our century in a field of science with which, to the casual observer, it might seem to have no alliance whatever. The wonderful theory of atoms, on which the whole gigantic structure of modern chemistry is founded, was the logical outgrowth, in the mind of John Dalton, of those early studies in meteorology.

The way it happened was this: From studying the rainfall, Dalton turned naturally to the complementary process of evaporation. He was soon led to believe that vapor exists in the atmosphere as an independent gas. But since two bodies cannot occupy the same space at the same time, this implies that the various atmospheric gases are really composed of discrete particles. These ultimate particles are so small that we cannot see them—cannot, indeed, more than vaguely imagine them—yet each particle of vapor, for example, is just as much a portion of water as if it were a drop out of the ocean, or, for that matter, the ocean itself. But again, water is a compound substance, for it may be separated, as Cavendish had shown, into the two elementary substances hydrogen and oxygen. Hence the atom of water must be composed of two lesser atoms joined together. Imagine an atom of hydrogen and one of oxygen. Unite them and we have an atom of water; sever them, and the water no longer exists; but whether united or separate the atoms of hydrogen and of oxygen remain hydrogen and oxygen and nothing else. Differently mixed together or united, atoms produce different gross substances; but the elementary atoms never change their chemical nature—their distinct personality.

It was about the year 1803 that Dalton first gained a full grasp of the conception of the chemical atom. At once he saw that the hypothesis, if true, furnished a marvelous key to secrets of matter hitherto insoluble—questions relating to the relative proportions of the atoms themselves. It is known, for example, that a certain bulk of hydrogen gas unites with a certain bulk of oxygen gas to form water. If it be true that this combination consists essentially of the union of atoms one with another (each single atom of hydrogen united to a single atom of oxygen), then the relative weights of the original masses of hydrogen and of oxygen must be also the relative weights of each of their respective atoms. If one pound of hydrogen unites with five and one-half pounds of oxygen (as, according to Dalton's experiments, it did), then the weight of the oxygen atom must be five and one-half times that of the hydrogen atom. Other compounds may plainly be tested in the same way. Dalton made numerous tests before he published his theory. He found that hydrogen enters into compounds in smaller proportions than any other element known to him, and so, for convenience, determined to take the weight of the hydrogen atom as unity. The atomic weight of oxygen then becomes (as given in Dalton's first table of 1803) 5.5; that of water (hydrogen plus oxygen) being of course 6.5. The atomic weights of about a score of substances are given in Dalton's first paper, which was read before the Literary and Philosophical Society of Manchester, Oct. 21, 1803. I wonder if Dalton himself, great and acute intellect though he had, suspected, when he read that paper, that he was inaugurating one of the most fertile movements ever entered on in the whole history of science?

II.

Be that as it may, it is certain enough that Dalton's contemporaries were at first little impressed with the novel atomic theory. Just at this time, as it chanced, a dispute was waging in the field of chemistry regarding a matter of empirical fact which must necessarily be settled before such a theory as that of Dalton could even hope for a hearing. This was the question whether or not chemical elements unite with one another always in definite proportions. Berthollet, the great co-worker with Lavoisier, and now the most authoritative of living chemists, contended that substances combine in almost indefinitely graded proportion between fixed extremes. He held that solution is really a form of chemical combination—a position which, if accepted, left no room for argument.

But this contention of the master was most actively disputed, in particular by Louis Joseph Proust, and all chemists of repute were obliged to take sides with one or the other. For a time the authority of Berthollet held out against the facts, but at last accumulated evidence told for Proust and his followers, and toward the close of the first decade of our century it came to be generally conceded that chemical elements combine with one another in fixed and definite proportions.

More than that. As the analysts were led to weigh carefully the quantities of combining elements, it was observed that the proportions are not only definite, but that they bear a very curious relation to one another. If element A combines with two different proportions of element B to form two compounds, it appeared that the weight of the larger quantity of B is an exact multiple of that of the smaller quantity. This curious relation was noticed by Dr. Wollaston, one of the most accurate of observers, and a little later it was confirmed by Johan Jakob Berzelius, the great Swedish chemist, who was to be a dominating influence in the chemical world for a generation to come. But this combination of elements in numerical proportions was exactly what Dalton had noticed as early as 1802, and what had led him directly to the atomic weights. So the confirmation of this essential point by chemists of such authority gave the strongest confirmation to the atomic theory.

During these same years the rising authority of the French chemical world, Joseph Louis Gay-Lussac, was conducting experiments with gases, which he had undertaken at first in conjunction with Humboldt, but which later on were conducted independently. In 1809, the next year after the publication of the first volume of Dalton's "New System of Chemical Philosophy," Gay-Lussac published the results of his observations, and among other things brought out the remarkable fact that gases, under the same conditions as to temperature and pressure, combine always in definite numerical proportions as to volume. Exactly two volumes of hydrogen, for example, combine with one volume of oxygen to form water. Moreover, the resulting compound gas always bears a simple relation to the combining volumes. In the case just cited the union of two volumes of hydrogen and one of oxygen results in precisely two volumes of water vapor.

Naturally enough the champions of the atomic theory seized upon these observations of Gay-Lussac as lending strong support to their hypothesis—all of them, that is, but the curiously self-reliant and self-sufficient author of the atomic theory himself, who declined to accept the observations of the French chemist as valid. Yet the observations of Gay-Lussac were correct, as countless chemists since then have demonstrated anew, and his theory of combination by volumes became one of the foundation-stones of the atomic theory, despite the opposition of the author of that theory.

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The true explanation of Gay-Lussac's law of combination by volume was thought out almost immediately by an Italian savant, Amadeo Avogadro, and expressed in terms of the atomic theory. The fact must be, said Avogadro, that under similar physical conditions every form of gas contains exactly the same number of ultimate particles in a given volume. Each of these ultimate physical particles may be composed of two or more atoms (as in the case of water vapor), but such a compound atom conducts itself as if it were a simple and indivisible atom, as regards the amount of space that separates it from its fellows under given conditions of pressure and temperature. The compound atom, composed of two or more elementary atoms, Avogadro proposed to distinguish, for purposes of convenience, by the name molecule. It is to the molecule, considered as the unit of physical structure, that Avogadro's law applies.

This vastly important distinction between atoms and molecules, implied in the law just expressed, was published in 1811. Four years later, the famous French physicist Ampère outlined a similar theory, and utilized the law in his mathematical calculations. And with that the law of Avogadro dropped out of sight for a full generation. Little suspecting that it was the very key to the inner mysteries of the atoms for which they were seeking, the chemists of the time cast it aside, and let it fade from the memory of their science.

This, however, was not strange, for of course the law of Avogadro is based on the atomic theory, and in 1811 the atomic theory was itself still being weighed in the balance. The law of multiple proportions found general acceptance as an empirical fact; but many of the leading lights of chemistry still looked askance at Dalton's explanation of this law. Thus Wollaston, though from the first he inclined to acceptance of the Daltonian view, cautiously suggested that it would be well to use the non-committal word "equivalent" instead of "atom"; and Davy, for a similar reason, in his book of 1812, speaks only of "proportions," binding himself to no theory as to what might be the nature of these proportions.

At least two great chemists of the time, however, adopted the atomic view with less reservation. One of these was Thomas Thomson, professor at Edinburg, who in 1807 had given an outline of Dalton's theory in a widely circulated book, which first brought the theory to the general attention of the chemical world. The other, and even more noted advocate of the atomic theory, was John J. Berzelius. This great Swedish chemist at once set to work to put the atomic theory to such tests as might be applied in the laboratory. He was an analyst of the utmost skill, and for years he devoted himself to the determination of the combining weights, "equivalents," or "proportions" of the different elements. These determinations, in so far as they were accurately made, were simple expressions of empirical facts, independent of any theory; but gradually it became more and more plain that these facts all harmonize with the atomic theory of Dalton. So by common consent the proportionate combining weights of the elements came to be known as atomic weights—the name Dalton had given them from the first—and the tangible conception of the chemical atom as a body of definite constitution and weight gained steadily in favor.

From the outset the idea had had the utmost tangibility in the mind of Dalton. He had all along represented the different atoms by geometrical symbols—as a circle for oxygen, a circle enclosing a dot for hydrogen, and the like—and had represented compounds by placing these symbols of the elements in juxtaposition. Berzelius proposed to improve upon this method by substituting for the geometrical symbol the initial of the Latin name of the element represented— O for oxygen, H for hydrogen, and so on—a numerical coefficient to follow the letter as an indication of the number of atoms present in any given compound. This simple system soon gained general acceptance, and with slight modifications it is still universally employed. Every school boy now is aware that H_2O is the chemical way of expressing the union of two atoms of hydrogen with one of oxygen to form a molecule of water. But such a formula would have had no meaning for the wisest chemist before the day of Berzelius.

The universal fame of the great Swedish authority served to give general currency to his symbols and atomic weights, and the new point of view thus developed led presently to two important discoveries, which removed the last lingering doubts as to the validity of the atomic theory. In 1819 two French physicists, Dulong and Petit, while experimenting with heat, discovered that the specific heats of solids (that is to say, the amount of heat required to raise the temperature of a given mass to a given degree) vary inversely as their atomic weights. In the same year Eilhard Mitscherlich, a German investigator, observed that compounds having the same number of atoms to the molecule are disposed to form the same angles of crystallization—a property which he called isomorphism.

Here, then, were two utterly novel and independent sets of empirical facts which harmonize strangely with the supposition that substances are composed of chemical atoms of a determinate weight. This surely could not be coincidence—it tells of law. And so as soon as the claims of Dulong and Petit and of Mitscherlich had been substantiated by other observers, the laws of the specific heat of atoms, and of isomorphism, took their place as new levers of chemical science. With the aid of these new tools an impregnable breastwork of facts was soon piled about the atomic theory. And John Dalton, the author of that theory, plain provincial Quaker, working on to the end in semi-retirement, became known to all the word and for all time as a master of masters.

(To be Continued.)

PHARMACY.

EPIDERMIN.—Fluorxylol and difluordiphenyl, in the proportion 1 : 5, is used as a salve and recommended for its antiseptic qualities.

BOLDIN.—The alkaloid of Peumus Boldus, is a greenish white powder, soluble in alcohol and ether, and used as a hypnotic, in doses of 0.002 to 0.006.

ANTIRHEUMATIN.—A mixture of fluorphenol and difluordiphenyl, in the proportion of 1 : 5, is used as a salve in cases of rheumatism, influenza and lumbago.

SODIUM SALT OF SULPHANILIC ACID.—Is very soluble in water, difficulty soluble in alcohol and insoluble in ether. It is used as an antipyretic and is much more soluble than antifebrin. The action is very rapid.

MOUTH WASH IN TABLET FORM.—Bernegan recommends the following recipe:

Heliotropin	0.01
Saccharine	0.01
Salicylic acid	0.10
Menthol	1.00
Milk sugar	5.00
Spirit of roses.	

The mass can be colored by using a little eosine or chlorophyll.

The Era Course in Pharmacy

J. H. BEAL, Sc.D., Ph.G., Director.

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LECTURE NO. 21.

Inorganic Chemistry.

The Oxygen Group.

OXYGEN. SULFUR. SELENIUM. TELLURIUM.

Like the halogens, these four elements exhibit a strongly marked group relationship, and a similar progression in physical characters and chemical properties. Like that group also, the first member of the oxygen group is the most active chemically, and the most distinctly non-metallic in character, while the last member is in many respects the least active and exhibits some qualities of a metallic character.

OXYGEN.

Symbol O. Valence 2. Atomic Weight 15.96. Specific Density 15.96.

Historical.—Oxygen was discovered by Priestley, Aug. 1. 1774, who obtained it by decomposing red mercuric oxid with the aid of a burning glass. Its name, derived from the Greek *oxus*, sour, and *gennao*, I produce, means literally generator of acids, and was given to it by Lavoisier because of the acid nature of many of its compounds.

Natural Sources.—Oxygen is the most abundant and most universally distributed element on the earth. It constitutes about twenty per cent. of the atmosphere, over eighty-five per cent. of the ocean, and from forty-four to forty-eight per cent. of the compounds which compose the solid portions of the earth's crust, or altogether about fifty per cent. of the entire matter of the globe. In combination with two or more other elements it is found in a vast number of substances. Nearly every compound familiar to every-day life contains it. The petroleum compounds are perhaps the most notable examples of non-oxygen containing substances.

About one-fifth of the terrestrial atmosphere consists of free or uncombined oxygen. The other four-fifths consist mainly of nitrogen, with smaller quantities of carbon dioxid, water vapor, argon, and various other gaseous substances. So far as animal life is concerned, the oxygen is the essential constituent of the air, the other substances acting merely as diluents. In the process of respiration the oxygen is absorbed by the blood, and is conveyed to the capillaries where it is given up to the various tissues.

Preparation.—Oxygen may be prepared by the electrolysis of acidulated water, but is more commonly obtained by the heating of compounds rich in the element to their points of dissociation, such as the easily decomposable oxids, permanganates, nitrates, chlorates, chromates, etc. Only a few of these methods need be described.

1. By heating mercuric oxid, which decomposes into oxygen and mercury. This method is of historical interest as being the process made use of by Priestley when he discovered the element.

$$HgO \text{ (heated)} = Hg + O.$$

2. By the heating of potassium chlorate, either alone or with manganese dioxid, which is the process commonly used in the production of oxygen on the small scale. (Fig. 22.) The decomposition takes place in two steps. The chlorate is first broken up into chlorid, perchlorate, and oxygen. Later the perchlorate decomposes into the chlorid and releases the remainder of the oxygen.

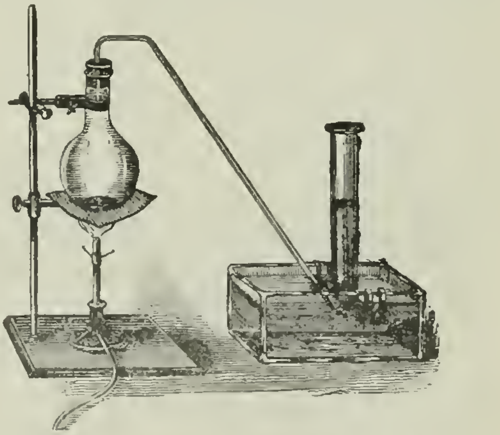

Fig. 22.—Making Oxygen from Potassium Chlorate.

$$2KClO_3 + MnO_2 \text{ (heated)} = KCl + KClO_4 + O_2 + MnO_2.$$

$$KClO_4 + MnO_2 = KCl + 2O_2 + MnO_2.$$

The manganese dioxid, without being itself decomposed or entering into combination, causes the oxygen to be released at a lower temperature than would otherwise be necessary. This is an example of what is known as *catalytic* action, where one substance by its mere presence causes or facilitates a chemical change in some other substance without being itself affected.

It is highly important that the manganese dioxid used should be free from organic matter, otherwise explosions are liable to occur, dangerous if large amounts are employed.

3. Brin's Process. This is one of the processes made use of in the production of oxygen on the commercial scale, and is based upon the ability of barium oxid to take up oxygen when heated in contact with air under pressure, and to give it out again when the pressure is reduced.

Barium oxid in the form of a porous mass is heated in iron cylinders in contact with air, which has been freed from carbon dioxid, at a pressure of about two atmospheres. Under such circumstances oxygen is taken up and the dioxid formed.

$$BaO + O = BaO_2.$$

The pressure is next reduced to about 14 pounds less than one atmosphere, when the dioxid decomposes into the monoxid and oxygen.

$$BaO_2 = BaO + O.$$

The gas is then compressed and stored in the iron or steel cylinders in which it is transported.

Description and Physical Properties.—When pure, oxygen, is an odorless, colorless, and tasteless gas, condensible at a pressure of 50 atmospheres and —118° C. to a transparent liquid, lighter than water, and paramagnetic. The gas is slightly soluble in water, 100 volumes of the latter dissolving 4.1 volumes, the solubility increasing with the pressure.

Chemical Properties.—Oxygen can be made to combine either directly or indirectly with nearly every known element. With all the metallic elements it unites directly, except in the case of the so-called "noble metals," as silver, gold and platinum. The oxids of these can, however, be produced by precipitating them from solutions of their salts. With fluorin it does not combine either directly or indirectly. With the remaining halogens it can be made to combine only in the presence of a third element.

The combination of elements with each other is frequently accompanied by a marked evolution of heat. When the combination takes place with such rapidity that sufficient heat is evolved to render one or more of the substances present luminous the process is termed combustion. Since oxygen is one of the elements concerned in all common cases of combustion, it is commonly said to be a "supporter of combustion." If, however, a stream of air or oxygen be conducted into a tank of coal gas and ignited it will burn similarly to a jet of the coal gas when the latter is ignited in the air, the zone of combustion being simply the region where the activity of combination is great enough to raise some of the particles concerned to incandescence. It is thus seen that the terms "combustible" and "supporter of combustion" are convertible, depending merely upon which substance forms the atmosphere surrounding the place of combination. When the combination is so slow that the temperature is not greatly raised above the normal temperature of the air, the process is termed slow oxidation. The decay and fermentation of organic substances are examples of slow oxidation.

The most striking property of pure oxygen or of an atmosphere rich in that substance is the readiness with which it supports combustion, even of materials ordinarily incombustible in the air. Iron in the form of wire, and many other metals, when raised to a red heat and plunged into a vessel of oxygen take fire and burn with great brilliancy. (Fig. 23.)

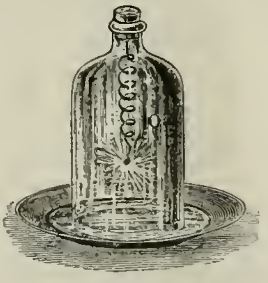

Fig. 23.—Watch Spring Burning in Oxygen.

Uses. The most common special use of oxygen is in the production of the oxyhydrogen flame. To produce this a stream of oxygen is led into a burner of special construction where it is met by a stream of hydrogen or coal gas, and the mingled gases are ignited, yielding a colorless flame of intensely high temperature. (Fig. 24.) The flame may be employed for the melting of refractory metals, or for the production of the "lime light" used in stereopticons, made by directing the stream of burning gas against a stick of lime which is thereby heated to a state of dazzling incandescence.

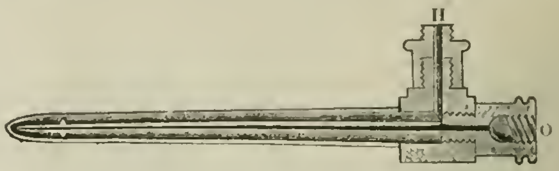

Fig. 24.—Structure of Oxy-Hydrogen Blowpipe.

OZONE.

The formula for the molecule of oxygen is O_2, signifying that it consists of two atoms. By passing an electric discharge through a vessel containing oxygen, and by several other methods it can be made to combine in molecules of three atoms each, or O_3. Oxygen in this state is known as Ozone. It exists in the atmosphere to some extent, and is more abundant in the air after thunder storms, and in country districts than in cities. The peculiar smell noticed in the neighborhood of electrical machines while in operation is due to ozone. It is also produced in small quantities by the slow oxidation of phosphorus in moist air. The ozone is simply a condensed form of oxygen is apparent from the equation—

$$3O_2 = 2O_3.$$

Owing to the readiness with which the third atom is given off, ozone presents the oxidizing effects of ordinary oxygen in an intensified degree. Substances perfectly stable in the presence of the element in its ordinary condition are quickly oxidized and decomposed by ozone. It attacks and quickly tarnishes mercury and silver by forming a coating of oxid on the surface. Its property of setting free iodin from iodids is made use of as a test. It has a peculiar penetrating odor, and when in quantity quickly attacks the lining membrane of the nose and throat.

Ozone is an instance of *allotropism* or the ability of an element to exist in different forms with different sets of properties, sometimes so greatly dissimilar that they might be taken for different elements were it not that one form can be converted into the others. Allotropic modifications are probably due to variation in the arrangement of atoms in the molecule, as in the present example.

COMPOUNDS OF OXYGEN.

Oxids and Hydroxids.—The compound formed by the union of oxygen with another element is known as an oxid, as calcium oxid, CaO, sulfur trioxid, SO_3, etc. An hydroxid is the compound of an element with the univalent radical *hydroxyl*, OH, and is formed when an oxid dissolves in or unites with water, as

$$CaO + H_2O = Ca(OH)_2$$

the latter compound being termed calcium hydroxid.

A marked difference exists between the oxids and hydroxids of the metals, or electro-positive elements, and the oxids and hydroxids of non-metals, or electro-negative elements. The metallic oxids and hydroxids are basic in character, and are commonly known as *bases*, while the non-metallic oxids are *acidic*, and their hydroxids constitute the class of inorganic oxygen acids. An example of the latter is seen when sulfur trioxid dissolves in water to form sulfuric acid, thus

$$SO_3 + H_2O = H_2SO_4.$$

The oxids of the non-metals are frequently termed *an-*

hydrids, since in many cases they may be regarded as acids minus water, as

$$H_2CO_3 - H_2O = CO_2.$$
$$2HNO_3 - H_2O = N_2O_5, \text{ etc.}$$

The most important property of the two classes of oxids and hydroxids is their power to neutralize each other, and form the important class of substances known as *salts*. For example, the oxid of calcium and the trioxid of sulfur may unite to form the neutral salt calcium sulfate, $CaSO_4$, possessing neither basic nor acidic properties.

$$CaO + SO_3 = CaSO_4.$$

The same compound may also be produced by the union of calcium hydroxid and sulfuric acid. In this case the reaction differs from the last in that water is formed and eliminated.

$$Ca(OH)_2 + H_2SO_4 = CaSO_4 + 2H_2O.$$

This division of the oxids and hydroxids into acid and basic is only relatively correct, since the same compound may be basic toward some elements and capable of acting as an acid radical toward others of a more decided basic character. Some undoubted metals form acids when oxidized to their highest valence, as chromium in chromic acid, H_2CrO_4, manganese in permanganic acid, $HMnO_4$, iron in ferric acid, H_2FeO_4, etc. In like manner some of the common acid-forming oxids may act as bases toward oxids of still stronger acid properties.

In addition to the preceding, oxygen forms a class of indifferent or neutral oxids which either do not possess acidic or basic properties, or possess them only to a very slight degree. Water and hydrogen peroxid are examples of these, as well as various metallic peroxids, as manganese dioxid, MnO_2. Such peroxids may in fact be regarded as intermediate between the bases and acids. If one atom of oxygen be taken from MnO_2 there is left the monoxid, MnO, a decided base. On the other hand, if additional oxygen be added to the molecule, its acid qualities are equally well marked.

Hydrogen Compounds.—Oxygen forms two compounds with hydrogen, the *monoxid* and *dioxid*.

Hydrogen Monoxid, or water, H_2O, is formed when a stream of hydrogen is burnt in the air. The reaction takes place explosively if the gases are first mixed and then ignited. It is also one of the products when an oxid or hydroxid is dissolved by an acid, as in the following equation:

$$NaOH + HCl = NaCl + H_2O.$$

Natural water is always contaminated by gaseous and solid impurities dissolved from the air or earth. The pure liquid is obtained by distillation, rejecting the first and the last portion in the still containing the solid impurities, and collecting the middle portion. The amount collected should not exceed 80 per cent. of the whole.

When pure water is odorless, tasteless, and colorless, or in thick layers of a bluish color, has a neutral reaction, and dissolves a greater number of substances than any other known solvent. It attains its greatest density at 4° C., and consequently expands if its temperature is either raised or lowered from this point. At 0° C. its density has decreased to 0.999, while its volume has increased to 1.001 of the volume at 4° C. The crystallizing or freezing point of water has been adopted as the zero, and its boiling point as the temperature of 100 degrees on the Centigrade thermometer. In determining these the atmosphere is supposed to be at the standard pressure of 760 mm.

At its greatest density, 4° C., it is adopted as the scientific standard for the specific gravities of liquids and solids, though for common purposes the temperatures of 15° C. or 20° C. are usually preferred as being more easily obtained.

It is an essential constituent of all animal and vegetable tissues, amounting to 70 per cent. by weight of the human body, and forming a large proportion of the substance of plants.

Hydrogen Dioxid or Peroxid, H_2O_2, is formed when certain peroxids are decomposed by acids. The following equation represents the reaction which takes place in its manufacture according to the process of the U. S. P.:

$$3BaO_2 + 2H_3PO_4 = Ba_3(PO_4)_2 + 3H_2O_2.$$

Absolute hydrogen dioxid is a colorless, oily liquid, of specific gravity 1.452. It is a very instable substance, slowly decomposing at all common temperatures into oxygen and water. At higher temperatures the decomposition proceeds more rapidly, and may become explosively violent. On this account the substance is never used pure, but only in solution, the strength of which is usually designated by the volumes of oxygen which the solution can release, e. g., a "ten volume solution" is one which will yield 10 volumes of free oxygen from one volume of the liquid. The *Aqua Hydrogenii Dioxidi* of the U. S. P. is required to be a ten volume solution, or to contain about three per cent. by weight of the pure dioxid.

On account of the readiness with which it parts with its oxygen, hydrogen dioxid is a valuable oxidizing agent. It is also capable of acting as a reducing agent toward such compounds as yield up their oxygen readily, as the permanganates, and the oxids of the noble metals. It is used largely for the bleaching of hair and wool, and in medicine as an antiseptic and germicide. Solutions of the dioxid in various liquids, as water, glycerin, etc., are sold under trade names as hair bleaches, and as surgical and dental disinfectants.

Two characteristic reactions of hydrogen dioxid are that it colors a solution of a chromate, acidulated with sulfuric acid, deep blue, due to the formation of perchromic acid, and that it will release iodin from potassium iodid *in the presence of ferrous sulfate*.

The numerous other compounds of oxygen are most advantageously considered in connection with the different elements with which it combines.

PRACTICAL STUDIES.

1. In a flask or test tube place 5 or 10 grams of potassium chlorate in crystals, mixed with manganese dioxid, and heat in a bunsen burner or alcohol lamp flame. (Fig. 25.) By means of a delivery tube collect several larger tubes full of the gas by displacement of water. Leave the tubes of gas mouth downward in the water of the pneumatic trough until wanted for use.

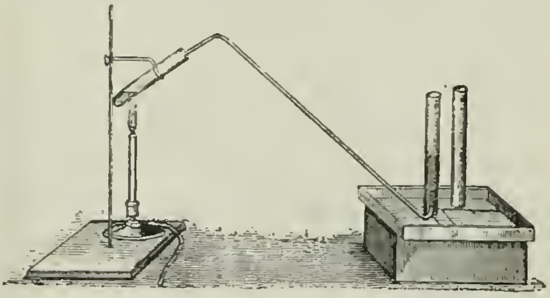

Fig. 25.—Student's Oxygen Generator.

2. Into one of the tubes held mouth upward insert a pine splinter the end of which is a glowing coal. What occurs?

3. Tip a straightened piece of watch spring, about 15 cm. long, with sulfur. Ignite the sulfur and hold it in the oxygen contained in another tube. If the conditions are properly observed and sufficient oxygen is present the watch spring will burn with a shower of brilliant sparks. The sparks given off, if collected will be found to be magnetic. They are in fact magnetic oxid of iron, Fe_3O_4.

Instead of collecting the gas in tubes, the splinter bearing the live coal and the watch spring may be held directly in the tube in which the oxygen is being released, but in this case it will be found harder to cause the ignition of the spring because of the diluting effect of the air which is present.

4. In the bottom of a jar place a piece of yellow phosphorus the size of a grain of Indian corn. (Do not handle the phosphorus with the fingers.) Partially cover the phosphorus with water to prevent its ignition, cover the jar loosely and set aside for eight or ten hours or a day. At the end of that time hold in the jar a strip of paper coated with starch paste and a solution of potassium iodid. What change takes place in the color of the paper, and what does it indicate as to the gaseous content of the jar?

5. Prepare and test a solution of hydrogen dioxid in the following manner: Place one or two grams of barium dioxid in a test tube, add 10 Cc. of water and mix thoroughly by agitation. Next add slowly a few drops of dilute sulfuric acid, shake again and permit to settle. Pour off part of the clear solution of hydrogen dioxid, add to it 2 Cc. of ether and several drops of a solution of potassium dichromate, and again agitate. The chromium is oxidized to perchromic acid which colors the ethereal layer blue.

6. Pour the remaining clear solution in a watch crystal or evaporating dish and place in it some dark colored hair, or a piece of cloth dyed with an organic coloring matter and note the result.

Write an equation showing the reaction between the barium dioxid and sulfuric acid.

LECTURE No. 22.

Pharmaceutical Physics.

Refraction of Light.

Nature of Refraction.—When a ray of light passes from one medium into another of different density at any other than a right angle, its direction will be changed at its entrance into the new medium. This bending or turning aside of the light rays is termed refraction. When the passage of the light is into a denser medium, as from air into glass or water, the direction of the refraction is toward a perpendicular to the surface which it enters. When the passage is into a less dense medium, as from glass or water into air, the refraction is away from the perpendicular to the surface which it enters.

In this connection it is to be noted that the density here referred to is *optical density*. Turpentine, which is less dense than water, in the sense of having a lower specific gravity, is optically more dense and refracts light more strongly than that liquid.

The entering ray is known as the incident ray, and the angle which it makes with a perpendicular to the new medium as the angle of incidence. The bent ray is the refracted ray and the angle which it makes to the perpendicular is the angle of refraction.

Examples of Refraction.—When a stick is immersed in water the immersed portion appears to be shortened. If the stick be immersed obliquely the immersed portion seems both shortened and bent upwards. The reason for this is apparent from an inspection of the illustration. (Fig. 62.) The dotted lines show the direction of the rays from the point of the stick which on entering the air are refracted toward the water surface, and hence enter the eye as if they originated at a higher point. As an object is always seen in the direction from which it sends light to the eye, the end of the stick appears elevated above its true position.

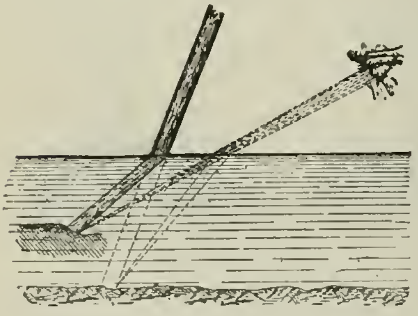

Fig. 62.—Appearance of Immersed Stick.

It is in consequence of a similar refraction of the light that the water of a clear pool, viewed obliquely, does not appear to be more than about three-fourths of its actual depth.

Cause of Refraction.—The cause of refraction is the alteration in velocity which light rays undergo when they encounter a medium of different optical density than that which they have been traversing.

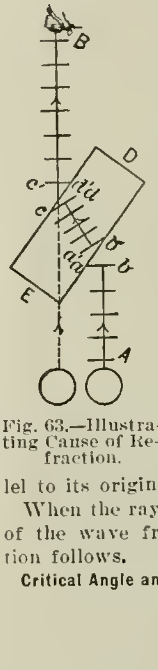

Fig. 63.—Illustrating Cause of Refraction.

In the diagram (Fig. 63) it will be noticed that the upper side of the wave strikes the denser medium before the lower side, and is consequently the first to suffer retardation. This causes the ray to swing partly around and take a new direction through the glass. At the opposite surface of the glass a reverse phenomenon occurs. The upper side of the ray which was the first to enter the glass, is now the first to leave it, and as a consequence its velocity is increased while the lower portion is still dragging along in the denser medium.

The result of these two refractions is that the ray on emergence is parallel to its original direction, but displaced laterally.

When the ray enters the glass at a right angle all parts of the wave front are equally retarded, and no refraction follows.

Critical Angle and Total Reflection.—Whether a given ray of light will or will not emerge from a medium in which it is traveling depends upon the angle which it makes with the surface. (Fig. 64.)

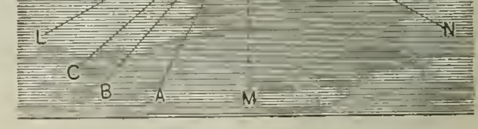

Fig. 64.—Critical Angle and Total Reflection.

If the darker portion of the cut be understood to represent a dense medium, as glass, it will be seen that as the angles of the incident rays AO and BO increase, the refracted rays rapidly approach the surface of the denser medium. The ray CO just coincides with the surface along OS, and the angle between COM is therefore known as the *critical angle*, because any ray which is incident at a greater angle than this, as the ray LO, will not pass into the atmosphere, but be reflected back into the glass, along the path ON. This phenomenon, known as *total reflection*, will occur for every ray whose angle of incidence is greater than the critical angle. Toward such rays, then, the transparent surface of the glass acts as a perfect mirror.

Practical application is made of the principle of total reflection in many optical instruments, as in one form of the *camera lucida*, used with the compound microscope.

Prisms and Lenses.—Any transparent body with plane sides, two or more of which are inclined to each other, is called an *optical prism*. An example is the triangular prism previously mentioned.

Any transparent body one of whose surfaces is curved is called a *lens*.

According to their forms lenses may be divided into two classes, *convex* and *concave*. (Fig. 65.)

A convex lens is one which is thicker at its center than at its edge. Three varieties may be distinguished: (1) Double-convex, or bi-convex, with two convex surfaces. (2) Plano-convex, with one plane and one convex surface. (3) Concavo-convex, with one concave and one convex surface, and thinnest at the circumference.

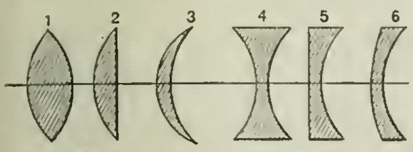

Fig. 65.—Convex and Concave Lenses.

A concave lens is one whose thickest portion is at the circumference, and also exists in three modifications. (4) Double-concave, or bi-concave, with two concave surfaces. (5) Plano-concave, with one plane and one concave surface, and (6) Convexo-concave, with one convex and one concave surface, and thickest at the circumference.

Like concave and convex mirrors, lenses may be regarded as representing portions of spheres, and the terms center of curvature, principal axis, etc., may be used in the same way in describing their properties.

Effect of Lenses Upon Light Rays.—From the law of refraction it follows that a lens will refract light rays towards its thickest portion. Hence convex lenses will cause light rays to bend toward their centers, or to converge, while concave lenses will cause them to spread outwards, or to diverge. For this reason all convex lenses are called *converging lenses*, and all concave lenses *diverging lenses*.

When parallel rays, as from the sun, are caused to pass through a convex lens they are converged to a point known as the *principal focus*. (Fig. 66.) That this is a real focus may be shown by its ability to set fire to a piece of paper held at this point for a short time. If the rays are caused to originate at the principal focus they will be rendered parallel by passing through the lens.

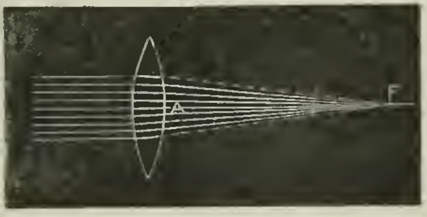

Fig. 66.—Effect of Convex Lens on Parallel Rays.

If the rays originate at a luminous point *outside of* the principal focus they will converge to another point on the opposite side of the lens. (Fig. 67.) Any two points so located that rays from one converge at the other are known as *conjugate foci*. An object placed at either of these foci will form a real, inverted image at the other.

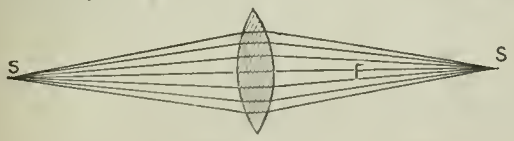

Fig. 67.—Conjugate Foci of Convex Lens.

Parallel rays passed through a concave lens become divergent on the opposite side. (Fig. 68.) The principal focus of a concave lens is a *virtual* focus, and is shown by the dotted lines of the figure.

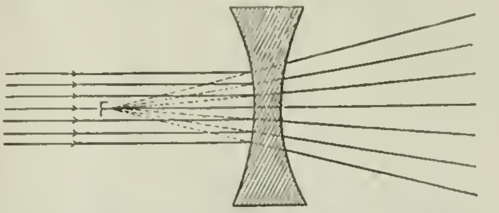

Fig. 68.—Effect of Concave Lens on Parallel Rays.

Formation of Images by the Convex Lens.—The character and size of the image produced by a convex lens depend upon the location of the object. When this is placed outside of the principal focus the image will be located on the opposite side of the lens and will be real, inverted, and of a size proportional to its distance from the optical center of the lens. As the object is brought nearer the lens the image recedes and grows larger. When the object is brought between the lens and its principal focus, the image suddenly appears on the same side of the lens, erect, and magnified. Such an image is, of course, virtual.

A bi-convex lens mounted in a suitable holder and used in this manner constitutes the common pocket magnifier, or simple microscope.

Spherical Aberration.—The curvature of a convex lens usually corresponds to the surface of a sphere of a radius equal to the distance between the center of curvature and the vertex of the lens. In consequence of this sphericity, the rays which strike the lens near its margin meet the surface at a greater angle than those which strike near the center, and are therefore brought more quickly to a focus on the other side. (Fig. 69.) The images formed by the central and marginal rays thus fall upon different planes, thereby producing a blurring effect which is known as *spherical aberration*. Two methods of correcting this fault in the image are employed. One is by the use of a diaphragm, a thin sheet of metal with a circular aperture, which is interposed between the lens and the place where the image is produced, thereby cutting off the images formed by the marginal rays. The diaphragm, of course, simply conceals the defect without removing it, and is the method of correction employed in the cheaper class of optical instruments.

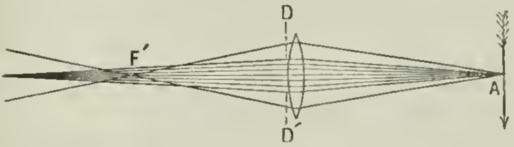

Fig. 69.—Spherical Aberration of Convex Lens.

Another and better method of correction is by carefully "flattening," or lessening, the curvature of the lens near its margin, so that both marginal and central rays are brought to a focus at the same point. A lens thus corrected is said to be aplanatic.

Chromatic Aberration.—Another property of the convex lens is that it tends to act like a prism and to disperse light, or to separate it into its constituent colors by bringing the shorter rays to a focus before the longer ones. This defect is known as *chromatic aberration*, and has the effect of causing images formed by such lenses to be surrounded by a ring or fringe of colored light.

Chromatic aberration can also be concealed by the use of the diaphragm, but is best corrected by taking advantage of the differences in the refractive and dispersive powers of flint and crown glass. If to the convex lens of crown glass there be cemented a plano-convex lens of flint glass, the latter will counteract the dispersion of the former, but will not be able to neutralize all of its refraction, and in this way permits the convex lens to form a colorless image. A combination of this kind is called an *achromatic lens*. (Fig. 70.)

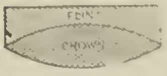

Fig. 70.—Achromatic Lens of Crown and Flint Glass.

DOUBLE REFRACTION AND POLARIZATION OF LIGHT.

Double Refraction.—If a transparent piece of the mineral known as Iceland spar be placed over a word, the letters will appear double. (Fig. 71.) If the crystal be rotated, the letters of one set will be seen to rotate around the others. This phenomenon is known as *double refraction*, and will occur for every position in which the crystal may be placed except one. When the object is looked at along one diameter of the crystal, known as the *optic axis*, double refraction does not occur. A plane which contains the optic axis is known as a *principal plane*, and a section made along this plane as a *principal section*.

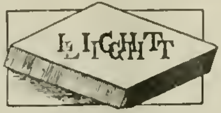

Fig. 71.—Double Refraction by Iceland Spar.

The light on entering a double refracting substance is divided into two parts, one of which, termed the *ordinary ray*, is refracted in the usual manner; the other, termed the *extraordinary ray*, is not.

When light which has passed through Iceland spar is examined by appropriate means it is found to have acquired a new set of properties. It is now capable of reflection in certain directions only, and of penetrating many transparent substances in some directions, but not in others, and, in short, acts as if it had acquired definite sides and vibrated only in certain planes. Light in this condition is said to be *plane polarized*, and can be produced by the transmission of ordinary light through numerous transparent substances, and by reflection from polished surfaces.

The Nicol Prism.—One of the most efficient methods for polarizing light, or of recognizing it after it is polarized is the *nicol prism*. This consists of a rhomb of Iceland spar which has been cut diagonally, or along the principal plane, and the two pieces cemented together again by Canada balsam. (Fig. 72.) When a beam of light is admitted in the direction of the arrows of the figure it is doubly refracted, as previously described. The ordinary ray strikes the balsam surface at an angle greater than the critical angle, and is hence reflected to one side and out of the crystal, while the extraordinary ray strikes the balsam at less than its critical angle and consequently passes through. The nicol prism thus enables us to get a single ray of light polarized in one plane.

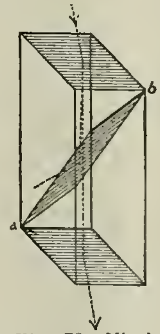

Fig. 72.—Nicol Prism.

The Polariscope.—If the polarized ray from one nicol prism be admitted to a second nicol it will pass through, provided the latter be so placed that its principal plane is parallel to the principal plane of the first, but if the second prism be rotated through one-quarter of a circle so that their principal planes are not parallel, the ray will be quenched and no light will pass through.

When two nicol prisms are used together in this manner, the first is called a polarizer and the second an analyzer. Such an arrangement constitutes a *polariscope*.

Theory of the Polariscope.—It is believed that a ray of ordinary light vibrates in every direction across its path of propagation, so that if we could see the end of an advancing wave for a sufficiently brief period it would present an appearance something like Fig. 73. After its polarization by Iceland spar it would present an appearance like *a*, Fig. 74, the ray now vibrating in two planes only, and these at right angles to each other. By means of the total reflection of the layer of balsam in the nicol, one of these planes is gotten rid of, and the transmitted light now vibrates in one direction only. This ray will pass through a second nicol when the principal planes of the prisms are parallel, but not when they are crossed.

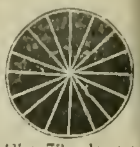

Fig. 73.—Imaginary Cross Section of Light Ray.

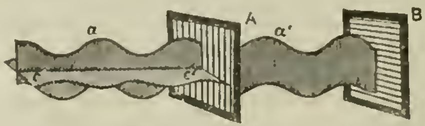

Fig. 74.—Ideal View of Polarized Light and Crossed Nicols.

Upon this theory, the two nicol prisms may be compared to that of two open gratings. (Fig. 74.) When the openings are parallel, the light will be transmitted, when these openings are crossed, it will be shut out.

THE ORGAN OF VISION AND ITS RELATION TO LIGHT.

The Eye.—The eye consists essentially of a closed, nearly spherical chamber, containing an arrangement of convex lenses and refractive media by means of which images are projected upon a delicate screen of nervous filaments located on the inner back wall of the chamber. (Fig. 75.) Beginning with the outermost coat we may distinguish the following different tissues: The *sclerotic*, (2) or "white of the eye," which in front is modified to form a circular transparent portion, the *cornea*, (1). Lining the sclerotic is the *choroid*, (3), a tissue saturated with a dark pigment, to prevent internal reflection. Covering the choroid in the posterior portion of the eye is the *retina*, (4), an exceedingly delicate tissue consisting of an expansion of the *optic nerve*, (o). Underneath the cornea is a small chamber filled with a limpid liquid, the *aqueous humor*. (7). Back of the aqueous humor lies the *iris*, (i. i.). a continuation of the choroid, and constituting the colored portion of the eye. In the center of the iris is a circular opening, the *pupil* (5). By the contraction or expansion of the iris the pupil narrows or enlarges, and regulates the amount of light admitted. Under the iris is seen the *crystalline lens*, (6), a bi-convex lens of tough, elastic, and transparent material. Underneath the crystalline lens and filling the main body of the eye is the *vitreous humor*, (8), a transparent, jelly-like substance.

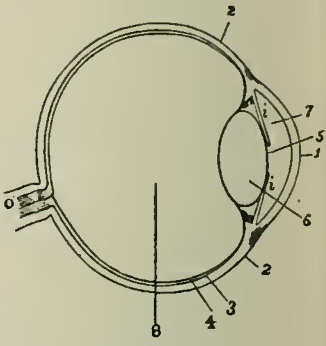

Fig. 75.—Diagrammatic Cross Section of the Eye.

The light rays coming from an object are refracted by the curved surface of the cornea, crystalline lens, and the two humors, which all together act like a single biconvex lens, and project an inverted image upon the retina which lines the posterior portion of the eye.

Microscopically the retina is found to consist of ten different layers, made up of nerve fibres, cells, granules, and pigment. In some way, not at present understood, possibly partly by chemical and partly by physical means, the light rays forming the retinal image originate nervous impulses in the nerve elements of this tissue, and these are transmitted along the optic nerve to the optic centers where they give rise to the sensation of sight.

Some Common Defects of the Eye.—In the normally constituted eye the curvature of the crystalline lens is unconsciously altered to accommodate the eye either for near or distant objects, and to cast a sharply defined image upon the retina. In some eyes the diameter from front to rear is so great that the rays of light are brought to a focus some distance in front of the retina instead of upon it. This condition is known as *Myopia*, or near-sight, and necessitates bringing the object very near to the eye, or the use of concave glasses, so as to give the rays greater divergence before they strike the cornea. In other cases the diameter of the eye is so short that the retina is in front of the plane where the image would usually be formed by the lens. This is known as *Hypermetropia*, or long-sight, and is remedied by convex glasses, whereby the rays are caused to converge and come to a focus more quickly. In old age the crystalline lens gradually loses its power of accommodation, so that it tends to focus diverging rays behind the retina. This condition is known as *Presbyopia*, and is corrected in the same way as hypermetropia, by converging lenses. *Astigmatism* consists of irregularity in the curvature of the cornea, rendering it impossible to see horizontal and perpendicular lines at the same time with equal distinctness. Astigmatism is remedied by the use of glasses of cylindrical instead of spherical curvature.

PRACTICAL STUDIES.

Immerse a stick in water and observe the change in appearance when held first perpendicularly and then obliquely.

Illustrate the principle of total reflection by holding a tumbler of clear glass, half filled with water, between yourself and a lamp, and elevating the tumbler above the level of the eye until an image of the light is seen in the surface of the water.

If possible, obtain a convex lens (one can be unscrewed from an opera or spy glass) and study the formation of images, and conjugate foci as described in the text. A simple magnifier will answer, if large enough.

From a butcher obtain the eye of an ox or other animal, recently killed, and with a sharp knife dissect it. Identify each of the following parts: The sclerotic and choroid coats, the iris, retina, cornea, aqueous humor, crystalline lens, and vitreous humor.

TESTING VASELINE.—According to the Pharm. Zeitung (Sci. Am.) proceed as follows: Two grammes vaseline dissolved in 5 grammes chloroform and agitated diligently with 10 c. cm. water are not changed by a drop of phenolphtalein solution, and show a strong red color upon the addition of a drop of one-tenth normal potash lye; whereby, on the one hand, the absence of the alkali is proved, and on the other hand, absolute freedom from acid: 10 grammes vaseline are heated with 10 grammes water in a water bath one-quarter hour. After cooling, the decanted water, which reacts entirely neutral and gives no reaction on sulphuric acid with chloride of barium, is evaporated on a watch glass, whereupon only an imponderable residuum remains. Vaseline is made brown by sulphuric acid (98 per cent.) in the water bath. If a weaker acid (73 per cent.) is used, no influence is shown and the acid is only changed if the preparation is imperfectly purified (technical vaseline.) The best way to proceed is as follows: Ten grammes vaseline are melted in a water bath and 50 drops of a 73 per cent. sulphuric acid added. Now heat one-quarter hour in the water bath while stirring. In the case of pure vaseline the sulphuric acid is hardly changed. No dark ring forms where the two zones touch when the acid is allowed to settle, nor is the acid dyed brown. Five grammes vaseline are heated with 5 grammes carbonate of soda and 25 grammes water in the water bath one half hour, while stirring. After cooling, the aqueous solution is decanted and supersaturated with diluted hydrochloric acid. The liquid remains clear, if neither resins nor fatty acids were present.

(*Continued from page 676, Nov. 4.*)

THE CENTURY'S PROGRESS IN CHEMISTRY.*

BY HENRY SMITH WILLIAMS, M. D.

III.

During those early years of our century, when Dalton was grinding away at chemical fact and theory in his obscure Manchester laboratory, another Englishman held the attention of the chemical world with a series of the most brilliant and widely heralded researches. Humphrey Davy had come to London in 1801, at the instance of Count Rumford, to assume the chair of chemical philosophy in the Royal Institution, which the famous American had just founded.

Here, under Davy's direction, the largest voltaic battery yet constructed had been put in operation, and with its aid the brilliant young experimenter was expected almost to perform miracles. And indeed he scarcely disappointed the expectation, for with the aid of his battery he transformed so familiar a substance as common potash into a metal which was not only so light that it floated on water, but possessed the seemingly miraculous property of bursting into flames as soon as it came in contact with that fire-quenching liquid. If this were not a miracle, it had for the popular eye all the appearances of the miraculous.

What Davy really had done was to decompose the potash, which hitherto had been supposed to be elementary, liberating its oxygen, and thus isolating its metallic base, which he named potassium. The same thing was done with soda, and the closely similar metal sodium was discovered—metals of a unique type, possessed of a strange avidity for oxygen, and capable of seizing on it even when it is bound up in the molecules of water. Considered as mere curiosities, these discoveries were interesting, but aside from that they were of great theoretical importance because they showed the compound nature of some familiar chemicals that had been regarded as elements. Several other elementary earths met the same fate when subjected to the electrical influence, the metals barium, calcium, and strontium being thus discovered. Thereafter Davy always referred to the supposed elementary substances (including oxygen, hydrogen and the rest) as "undecompounded" bodies. These resist all present efforts to decompose them, but how can one know what might not happen were they subjected to an influence, perhaps some day to be discovered, which exceeds the battery in power as the battery exceeds the blow-pipe?

Another and even more important theoretical result that flowed from Davy's experiments during the first decade of the century was the proof that no elementary substances other than hydrogen and oxygen are produced when pure water is decomposed by the electric current. It was early noticed by Davy and others that when a strong current is passed through water, alkalies appear at one pole of the battery and acids at the other, and this though the water used were absolutely pure. This seemingly told of the creation of elements—a transmutation but one step removed from the creation of matter itself—under the influence of the new "force." It was one of Davy's greatest triumphs to prove, in the series of experiments recorded in his famous Bakerian lecture of 1806, that the alleged creation of elements did not take place, the substances found at the poles of the battery having been dissolved from the walls of the vessels in which the water experimented upon had been placed. Thus the same implement which had served to give a certain philosophical warrant to the fading dreams of alchemy banished those dreams peremptorily from the domain of present science.

Even though the presence of the alkalies and acids in the water was explained, however, their respective migrations to the negative and positive poles of the battery remained to be accounted for. Davy's classical explanation assumed that different elements differ among themselves as to their electrical properties, some being positively, others negatively, electrified. Electricity and "chemical affinity," he said, apparently are manifestations of the same force, acting in the one case on masses, in the other on particles. Electro-positive particles unite with electro-negative particles to form chemical compounds, in virtue of the familiar principle that opposite electricities attract one another. When compounds are decomposed by the battery, this mutual attraction is overcome by the stronger attraction of the poles of the battery itself.

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This theory of binary composition of all chemical compounds, through the union of electro-positive and electro-negative atoms or molecules, was extended by Berzelius, and made the basis of his famous system of theoretical chemistry. This theory held that all inorganic compounds, however complex their composition, are essentially composed of such binary combinations. For many years this view enjoyed almost undisputed sway. It received what seemed strong confirmation when Faraday showed the definite connection between the amount of electricity employed and the amount of decomposiion produced in the so-called electrolyte. But its claims were really much too comprehensive, as subsequent discoveries proved.

IV.

When Berzelius first promulgated his binary theory he was careful to restrict its unmodified application to the compounds of the inorganic world. At that time, and for a long time thereafter, it was supposed that substances of organic nature had some properties that kept them aloof from the domain of inorganic chemistry. It was little doubted that a so-called "vital force" operated here, replacing or modifying the action of ordinary "chemical affinity." It was, indeed, admitted that organic compounds are composed of familiar elements—chiefly carbon, oxygen, hydrogen, and nitrogen—but these elements were supposed to be united in ways that could not be imitated in the domain of the non-living. It was regarded almost as an axiom of chemistry that no organic compound whatever could be put together from its elements—synthesized—in the laboratory. To effect the synthesis of even the simplest organic compound it was thought that the "vital force" must be in operation.

Therefore a veritable sensation was created in the chemical world when, in the year 1828, it was announced that the young German chemist Friedrich Wöhler, formerly pupil of Berzelius, and already known as a coming master, had actually synthesized the well-known organic product urea in his laboratory at Sacrow. The "exception which proves the rule" is something never heard of in the domain of logical science. Natural law knows no exceptions. So the synthesis of a single organic compound sufficed at a blow to break down the chemical barrier which the imagination of the fathers of the science had erected between animate and inanimate nature. Thenceforth the philosophical chemist would regard the plant and animal organisms as chemical laboratories in which conditions are peculiarly favorable for building up complex compounds of a few familiar elements, under the operation of universal chemical laws. The chimera "vital force" could no longer gain recognition in the domain of chemistry.

Now a wave of interest in organic chemistry swept over the chemical world, and soon the study of carbon compounds became as much the fashion as electro-chemistry had been in the preceding generation.

Foremost among the workers who rendered this epoch of organic chemistry memorable were Justus Liebig in Germany and Jean Baptiste André Dumas in France, and their respective pupils, Charles Frederic Gerhardt and Augustus Laurent. Wöhler, too, must be named in the same breath, as also must Louis Pasteur, who, though somewhat younger than the others, came upon the scene in time to take chief part in the most important of the controversies that grew out of their labors.

Several years earlier than this the way had been paved for the study of organic substances by Gay-Lussac's discovery, made in 1815, that a certain compound of carbon and nitrogen, which he named cyanogen, has a peculiar degree of stability which enables it to retain its identity, and enter into chemical relations after the manner of a simple body. A year later Ampère discovered that nitrogen and hydrogen, when combined in certain proportions to form what he called ammonium, have the same property. Berzelius had seized upon this discovery of the compound radical, as it was called, because it seemed to lend aid to his dualistic theory. He conceived the idea that all organic compounds are binary unions of various compound radicals with an atom of oxygen, announcing this theory in 1818. Ten years later Liebig and Wöhler undertook a joint investigation which resulted in proving that compound radicals are indeed very abundant among organic substances. Thus the theory of Berzelius seemed to be substantiated, and organic chemistry came to be defined as the chemistry of compound radicals.

But even in the days of its seeming triumph the dualistic theory was destined to receive a rude shock. This came about through the investigations of Dumas, who proved that in a certain organic substance an atom of hydrogen may be removed, and an atom of chlorine substituted in its place without destroying the integrity of the original compound—much as a child might substitute one block for another in its playhouse. Such a substitution would be quite consistent with the dualistic theory, were it not for the very essential fact that hydrogen is a powerfully electro-positive element, while chlorine is as strongly electro-negative. Hence the compound radical which united successively with these two elements must itself be at one time electro-positive, at another electro-negative—a seeming inconsistency which threw the entire Berzelian theory into disfavor.

In its place there was elaborated, chiefly through the efforts of Laurent and Gerhardt, a conception of the molecule as a unitary structure, built up through the aggregation of various atoms, in accordance with "elective affinities" whose nature is not yet understood. A doctrine of "nuclei" and a doctrine of "types" of molecular structure were much exploited, and, like the doctrine of compound radicals, became useful as aids to memory and guides for the analyst, indicating some of the plans of molecular construction, though by no means penetrating the mysteries of chemical affinity. They are classifications rather than explanations of chemical unions. But at least they served an important purpose in giving definiteness to the idea of a molecular structure built of atoms as the basis of all substances. Now at last the word molecule came to have a distinct meaning, as distinct from "atom," in the minds of the generality of chemists, as it had had for Avogadro a third of a century before. Avogadro's hypothesis that there are equal numbers of these molecules in equal volumes of gases, under fixed conditions, was revived by Gerhardt, and a little later under the championship of Cannizzaro, was exalted to the plane of a fixed law. Thenceforth the conception of the molecule was to be as dominane a thought in chemistry as the idea of the atom had become in a previous epoch.

(To be Continued.)

We are told by a North Dakota paper that a druggist in one of the towns of that State "had a bottle of compound of amol explode in his drug store," doing a whole lot of damage. This is a new one on us. These papers ought to be more explicit.

(Concluded from page 668, Nov. 4.)

SOME MODERN DISINFECTANTS.*

By E. A. De SCHWEINITZ, PH. D., M. D.
Chief of Biochemic Division, Bureau of Animal Industry, U. S. Department of Agriculture.

FOR BURNIRG FORMALDEHYDE.

Two simple lamps for this purpose may be described here, the one designed by Prof. Robinson, of Bowdoin College, the other by the writer. The latter involves the use of a wick in whole or in part of platinized asbestos. The lamp is filled with alcohol, and the wick turned up slightly and lighted in the ordinary way. After a minute the asbestos portion of the wick becomes heated to such a temperature that the platinum distributed over the surface will continue to glow and convert alcohol into aldehyde as long as the lamp remains filled. Prof. Robinson's lamp is described by himself as follows:

> I take a disk of moderately thick asbestos board and have it perforated with small holes close together. This is then platinized in the usual way, using quite a strong solution of platinic chloride. If now a shallow dish, cylindrically formed and of such size that the perforated asbestos disk will just cover its top, be partly filled with methyl alcohol, it serves as the lamp font. If the platinized disk be wet with alcohol, seized in a pair of forceps or small tongs, removed from the dish, and the alcohol lighted, it will, by the time its alcohol burns away, be heated sufficiently, so that when placed over the lamp font again it will continue hot and change the alcohol to aldehyde. Experience shows that with proper depth of dish and suitable holes for admission of air, the disk keeps of a proper redness to bring about the change most efficiently. The gas may also be applied by warming its solutions and better exhausting the air in a closed vessel containing formalin. If this solution is heated, some of the formaldehyde is polymerized and converted into an inactive form.

The use of formaldehyde for the purpose of destroying the spores of smut by the action of 1:10,000 formalin solution has been recommended. In all experiments in using this material, attention must be paid to the fact whether reference is made to the formalin solution or to formaldehyde gas. It is probable that with a convenient method of generating the gas this might be used to advantage in destroying insects injurious to vegetation.

Walter has carried out a series of experiments with formalin and also with the gas which can be obtained from it. His experiments were made first by preparing different kinds of culture media to which formalin had been added in different proportions. The results of these tests upon anthrax spores, cholera, typhus, and diphtheria germs showed that the proportion of 1:10,000 or 1:20,000 of formalin, or 1:25,000 of formaldehyde gas, is sufficient to check the growth of the germs. When the gas is used, the *Staphylococcus pyogenes aureus* seems to be the most resistant, while, strange as it may appear, the spores of anthrax, so difficult to kill by most germicides, are very easily destroyed by formalin. This is one of the principles laid down by Koch that some substances would be found which were destructive to pathogenic bacteria, but were less injurious to ordinary germs.

In order to prove the value of formalin on a large scale for the disinfection of clothing, Walter used a soldier's blue mixed with red color, which he immersed in a culture of the pure germ, so that the cloth was thoroughly saturated. Strips were then cut off, placed under a bell jar, and sprayed with formalin solution varying in strength from 3 per cent. to 10 per cent. The strips were left in the bell jar six hours. After that time tests were made by cultures from these strips, check strips being used at the same time. There was no change produced in the color of the cloth, and the red was, if anything, a little brighter. The germs which had penetrated deeply into the cloth were all killed, just as were those upon the surface. This can be explained probably by the fact that the articles being surrounded with the jar the gas was forced deeply into the interstices of the cloth and killed those germs which could not be reached by the solution. The 3 per cent. solution gave just as satisfactory results as the stronger solutions.

The preliminary experiments that Walter made with the gas to prove the availability of formaldehyde for the disinfection of clothing, etc., without injury to the latter were satisfactory except with reference to the length of time required. This, however, was due to the practical details of the method, as the source of formaldehyde was either the powder placed under a bell jar or a lamp used in a room which was poorly adapted to the purpose, there being too many openings for the escape of the gas.

SUMMARY.

The results of all investigations have led to the following conclusions:

1. Formalin in concentration, 1:10,000, makes the growth of tuberculosis, anthrax, cholera, typhus, pus and diphtheria germs impossible.
2. In gaseous form a weak dilution is sufficient to check growth.
3. A 1 per cent. solution will kill pathogenic organisms in an hour.
4. With a 3 per cent. solution and the final addition of alcohol it is possible to make the hands germ free. Whether the skin of the hands is attacked by this method remains to be proved.
5. Spraying with formalin solution and subsequent inclosure of the articles in a closed space will easily sterilize them.
6. Uniforms, etc., can be disinfected on a large scale without injury, twenty-four hours being required.
7. Fæces are deodorized by a 1 per cent. solution, and are in thirteen minutes germ free, and buildings can be readily disinfected by a 1 per cent. to 1.5 per cent. volume of the gas.
8. Formaldehyde is a useful etching material and preservative.

As compared with other disinfectants, such as corrosive sublimate, carbolic acid, lysol, etc., formaldehyde and its solutions have the advantage of not being retarded in their action by albuminoid matter and of not injuring the articles to which they are applied. Their use, therefore, seems to be well recommended and to fill many requirements which are not fully met by other disinfectants. Especially is this the case in disinfecting rooms, clothing, bedding, railroad cars, etc.

Experiments made by Roux, Trillat, and others upon the use of formaldehyde vapor for disinfecting rooms have been very satisfactory, in that the bacilli of anthrax, tuberculosis and diphtheria have been killed within five hours by a saturated atmosphere of formaldehyde gas. After two days of thorough ventilation no odor remained in the room, nor were the objects which had been exposed to the action of the gas in any way injured. An objection to the use of formaldehyde has been raised because it adheres somewhat tenaciously to clothing and upholstered materials and the odor dissipates slowly. This, however, can be removed by thorough ventilation, or by the use of a dilute solution of ammonia, which readily absorbs the gas. Placed in a room where formaldehyde has been used as a disinfectant, this would aid in a more rapid dissipation of the odor and not injure the materials. It would seem that in formaldehyde we have at hand the most useful disinfectant yet known, the application of which is a mere detail to be easily worked out in practice.

It also appears to be useful as a means of preserving food, milk, etc. Its effect upon the digestive ferments has not been thoroughly studied, but the quantity used for preserving milk, 1 part to 10,000, should be too small to give rise to any bad result, and none has been noted in practical use. Its influence in this connection should be carefully studied before it is generally recommended.

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*Year Book U. S. Department Agriculture, 1896.

While testing the action of this gas upon the cattle tick recently, its action upon the respiratory organs of cattle was noted. A calf was kept for five hours in an atmosphere containing about 2 per cent. of formaldehyde gas. During this time there was a slight watering from the eyes and it coughed occasionally, but it did not seem to be in any special distress, and as soon as it was brought into the fresh air again it was all right and showed no bad after-effects. This fact may prove of importance in disinfecting stables and the like.

Another direction in which formaldehyde promises to be of practical importance is in the disinfection of imported hides, which may carry contagion, especially anthrax. The rapid action and penetrating power of this gas bids fair to overcome the practical difficulties hitherto attending the use of disinfectants for this purpose.

In regard to the use of formaldehyde, it is of importance to know the percentage of gas which will be necessary to disinfect a room of given size and what percentage should be used in any given disease. If the alcohol used is entirely converted into aldehyde by the lamps, as indicated, 1 liter of pure wood alcohol will give 748 grams of aldehyde equal to 361 liters of this gas. The capacity of a room of 1,000 cubic feet is 28,684 liters, so the above quantity of alcohol would give 1.26 per cent. aldehyde in a room of this size. Experiments have shown that very much less than 1 per cent. by volume of this is destructive to injurious bacteria, but an atmosphere containing 1 to 1.5 per cent. by volume will give satisfactory results in six to thirteen hours in all cases. When the volume of the gas is increased, the length of time necessary for the disinfection is considerably decreased.

Of the mineral salts recommended as disinfectants in the solid form, many are deodorizers and not true disinfectants. Others, like corrosive sublimate, are too poisonous, or cannot be used with good effect in presence of albuminoid matter. One should always remember the difference between destroying the cause of infection, the only safeguard, and simply removing disagreeable odors.

Boiling water and steam are excellent disinfectants when they can be applied, but best of all for general disinfection are formaldehyde gas and its solutions.

PHARMACY.

A NEW REACTION FOR IODIDES.—Wachhusen states that if a few drops of paraldehyde are added to a solution of an iodide in the presence of starch, a reddish or blue coloration, according to the strength, is formed almost immediately. This reaction is claimed to detect one part per million of iodine.—Repertoire de Pharmacie; Pharm. Jour.

WHAT IS THE NOURISHING PART OF MEAT?—The only nutrient portion of meat, we are told by Modern Medicine (Lit. Digest) is the solid part. Hence beef tea, although stimulating, has no food value. Says this journal: "The only portion of the flesh of an animal which is possessed of real nutritive value is that part which has been alive and active before death. These living structures are not soluble; if they were, an animal which happened to fall into the water would dissolve like a lump of sugar. During life there is a small portion of nutritive material in solution in circulation in the body. After death, this small amount of soluble food material is rapidly converted into excrementitious matter; and as the skin, kidneys, and lungs cease their action, these poisonous substances rapidly accumulate within the body, the molecular or cell life of the body continuing some hours after death. It thus appears that beef tea, as a French physician recently remarked, is a 'veritable solution of poisons.' The only portion of the flesh which has any nutritive value is that which is thrown away in making the beef tea or extract. The popular faith in beef tea as a concentrated nourishment has, however, become so thoroughly fixed and rooted that some time will be required to rid the world of this erroneous idea; but it is highly important that information upon the subject should be disseminated as rapidly and as widely as possible, for there is no doubt that many lives are annually sacrificed by faith in the superior nutriment value of meat juices."

NEW BISMUTH BLUE.—If a chloride of bismuth solution is mixed with ferrocyanide of potassium, a yellow precipitate separates out, as reported by Fr. Faktor in the Ph. Post, which receives a light green color on shaking or boiling. After the addition of a few drops of nitric acid or potassium chlorate, the color changes into dark green and later into dark blue. With this vapors escape which betray hydrocyanic acid by the odor. In order to be certain that the bismuth blue is a product of the air oxidation, the color was produced in the absence of oxygen. The result was a green precipitate, which only changed its color when it came into contact with the air, taking on the blue color first on the surface and later more and more in the interior. As an oxidizing medium, chlorate of potassium or nitric acid has been found valuable. The blue precipitate produced in this manner was filtered, washed with hydrochloric acid and dried at 100° C. The dried precipitate forms a powder which assumes a darker color on heating. Bismuth blue is insoluble in cold or boiling water, likewise in cold and diluted hydrochloric acid; in strong hydrochloric acid it dissolves with a green color. In cold sulphuric acid it is insoluble, but is soluble in the concentrated acid. Nitric acid does not dissolve it. Diluted potash or soda lye changes the blue color to green. Ammonia changes the color into green-blue, if boiled long. In a cold soda solution the color does not change. When boiled bismuth blue passes into solution.—(N. Erf. u. Erf.)

MENTHOL FOR BURNS AND SCALDS.—Dr. Waterhouse writes in the Eclectic Medical Gleaner (West. Drug.) as follows: "Some years ago I believed that I had the best remedy for burns that could be found, and it is certainly a grand remedy, but now I believe I have something better. This first remedy was, to a bottle of ether I added as much tannin as the ether will dissolve, and which amount is surprisingly large. With this I brush over the burned parts. The ether quickly anæsthetizes the nerve periphery and is at once evaporated, and leaves the parts thickly covered with a film of tannin, not unlike collodion. Thus sealed from contact with the air, the pain is quickly relieved and the reparative process goes on rapidly, and you will be surprised to see some very bad burns heal without leaving much of a scar. About six months ago I was called in haste to see a child of eight years, who had accidentally upset a gallon of boiling coffee, which struck her upon the arm and ran down her side and legs. The hips and thighs were badly scalded, her clothing keeping the boiling fluid against her, rendered the burn more severe. The child was screaming with pain. I applied dry bandages of ordinary old cotton cloth to the parts, and putting menthol crystals into a dish of water, at the rate of probably 10 grains to the ounce, I directed the attendant to apply this solution to the bandages. In short order the pain was gone, and the child was ready for its breakfast. Only this one solution of menthol was needed, and the child was soon well. By relieving this irritation of the nerves the inflammatory action was much reduced and repair hastened. Of course this dressing is to be used in the first stages only.

THE PHARMACEUTICAL ERA

[*WEEKLY.*]

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"The British and Colonial Druggist," London.

Subscriptions and advertisements for this weekly drug journal will be received and forwarded through this office. Specimen copies and schedule of rates will be furnished upon application.

HOLIDAY ADVERTISING.

The holiday season is an event that is always well advertised. It has all the cumulated force of the advertising of years and centuries behind it and the result is that people are in a buying mood. Most merchants plan more or less advertising for this buying season, but the wise merchant knows that he is only one in a crowd of his fellows, and knows that his advertising, to be successful, must be distinctive and show its head and shoulders above the crowd.

One way to make advertising "stick out" is to use pictures in connection with it, and furnishing appropriate illustrations for drug store goods is one of the purposes of the Era's department of "Druggists' Advertising." The list of cuts published includes many which are available for advertising holiday goods, and selections may be made from back numbers of the Era, or from the book, "Sample Advertisements," which, in addition to showing 180 illustrations, contains appropriate advertisements written and printed to accompany each picture. The price of the book is 50 cents per copy, postpaid, and of the cuts 50 cents each or three for $1.00.

The Free Alcohol Hearings.

The Joint Select Committee of Congress, under the chairmanship of Senator O. H. Platt, is, as every one knows, holding hearings in various sections of the country in the endeavor to find out if we do or do not want alcohol free of tax for use in the arts and manufactures. Meetings have been held in Chicago, St. Louis, Cincinnati, and, last week, in New York, all of which have been duly reported in these columns. The great diversity of testimony and the variety of industries looked into make the hearings most interesting and instructive as well.

There seems to be but two main reasons advanced by objectors to the tax free proposition. The first is that the witness fears injury to his own pocket. This is a very natural position, but is rendered untenable when it is plainly shown, as it is in very many instances, that what is possible or probable injury to one is for the ultimate good of the many. This class of objectors furnishes the very best of reasons why we should have free alcohol, though they don't intend to. The second objection is that free alcohol is impracticable. Its force is greatly lessened when Senator Platt softly inquires if in witness' opinion free alcohol would not be a boon, provided the Government were protected against fraud, and witness as softly answers, yes. This occurs quite frequently during the hearings.

As we have stated before, and very decidedly too, the position of the retail drug trade has not always been fairly represented. Self-appointed representatives of pharmaceutical associations have given the views of those druggists who are opposed to free alcohol, but have uniformly kept silent regarding the many thousands who do want it. But we believe the committee is "on to" these misrepresentations, and is convinced that the retail drug trade does want free alcohol. Straws indicate the direction of the wind, and though we would not anticipate the committee's recommendations to Congress, there are not lacking indications that the committee has come to the belief that free alcohol would be a good thing, that we ought to have it, and that we can have it without hedging it about with all manner of burdensome restrictions such as some of the objectors fear. In a spirit of prophecy let us foretell that the results of the committee's work will be embodied in a bill of this nature.

Copyright in Advertisements.

That there is a distinction between ordinary literature and the writings of the business world seems to be established in a decision recently handed down by Judge Jenkins of the U. S. Court of Appeals, at Chicago. Litigation arose over the publication by rival firms of catalogues, both containing similar illustrations of bath tubs, and in the opinion the judge said:

"The statutes provide that the words 'engravings,' 'cuts,' 'prints,' shall be applied only to pictorial illustrations or works connected with the fine arts, and no prints or labels designed to be used for any other article. To be entitled to a copyright the article must have by and of itself some value as a composition, at least to the extent of serving some purpose other than as a mere advertisement. The object of the provision was to promote the dissemination of learning by inducing intellectual labor in works which would promote the general knowledge in science and useful arts. It is not designated as a protection to trades in the particular manner in which they might shout their wares. So far as the decisions of the Supreme Court have gone we think they hold to the proposition that mere advertisements, whether by letter press or by picture, are not within the protection of the copyright law."

This conclusion may be good law, but the manner of its statement must grate harshly upon the ears of the advertising fraternity. It seems that their productions do not "promote the dissemination of learning" and their art is by implication barred from the category of the fine and useful. It is quite possible that the legal mind has so far become wedded to precedent that it does not fully grasp the spirit and significance of modern advertising, whose entire mission is to educate people as to goods and values. If the photographer may secure a copyright upon his work it should certainly not lose the protection granted when used as an advertisement. Writers and artists are certainly putting some of their best efforts into the advertising field and they are certainly entitled to protection. If the present copyright law does not accord this it possibly needs revision

The Wisconsin Food and Drug Act.

The Wisconsin Board of Health and the Board of Pharmacy are co-operating hand in hand in work preliminary to the enforcement of the Patent Medicine Law, which goes into effect January 1. This law was referred to and commented upon in these pages very recently. It rules that any proprietary preparation which contains poison must not be sold in the State of Wisconsin, save by permit of the Board of Health, and in that event must bear a label stating what the poisonous ingredient is, and in what proportion it is present. The two boards mentioned intend to see that this law is carried out without fear or favor, but justly, and not unreasonably rigorously. To this end a circular has been prepared to be mailed to dealers throughout the entire State, setting forth the provisions of the law, urging them to investigate their stocks, and set their houses in order in good season. Evidently Wisconsin will be a rocky State for proprietors who do not wish to comply with the provisions of this act. The particular provision mentioned, that relating to poisons in proprietary medicines, is but one of a number constituting the entire act, which relates to all foods and medicines. It is a very comprehensive law, and in the main seems very satisfactory in principle and requirements. The honest have no reason to fear it.

Do You Believe It?

We learn from a contemporary that a German chemist has prepared a fluid that has the power when injected into the tissues of a plant near its roots, of anesthetizing the plant. These German chemists are great on wonderful discoveries, but credulity is sorely taxed when we are expected to believe that the plant, treated as indicated, does not die, but simply stops growing, maintaining its fresh green appearance, though its vitality is apparently suspended. Nor is this all of the wonder tale. The plant is also made independent of temperature changes, the most delicate hothouse plants continuing to bloom in the open. (But, if growth is entirely suspended, how can they 'continue' to bloom?) This German chemist is not to be robbed of the reward for his discovery, for the composition of the fluid is shrouded in the greatest secrecy. We must be content with the fragmentary information that it has a pungent odor and is colorless. But it is to be hoped that this plant anesthetizer will very soon be placed on the market, for there are a number of plants it is desirable to put to sleep as soon as possible.

The death of a druggist in Pennsylvania is recently announced, but it is farther stated that he left property valued at more than $50,000.

For Fewer Hours.

One very forcible reason why the hours of labor in the drug store should be lessened in number was barely touched upon by a correspondent whose letter was published last week. It is that with fewer hours of hard work, druggists would have, as they should have, time and inclination for testing their drugs and for doing original work. Such a result cannot be characterized as impossible, chimerical, but the argument possesses the solid basis of likelihood. There would be some, few or many, among druggists who would thus spend a portion of their time. It would not be toil, but a pleasure, and an aid to attaining the position of professional men in the public's estimation and particularly in one's own.

Is the "Shorter Hours" (horrible term) movement purely a business one; does it not also promise to work well for the progress of professional pharmacy in which all recognize lies the safety of the calling?

My, Oh My.

Dr. W. K. Grayson, of Whitehouse, Texas, closes an article in the Texas Medical News of July, 1897, on "Tobacco—Its Nature and Effects upon the Human Economy" as follows:

> "The use of tobacco is one of the worst forms of intemperance, and one of the surest means to produce disease. Morally, it is a filler of untimely graves, a slayer of conscience, a crowder of insane asylums, a maker of drunkards, a seducer of female innocence, an insidious, wily, successful tempter to the bad, a breaker-down of honor, stifles emotion, a scourge of man, contemner of God, a laugher at religion, mocker of human agony, a snake whose coils once wound round a man proves stronger than cords and coils of steel."

We didn't know we were so bad.

There is a drug clerk out in Spokane, Wash., who will wish he had never been born, if a suit for damages now lying against him be successful, and if the State Board of Pharmacy awakens to its duty. The Board of Pharmacy, too, will come in for a lot of well deserved criticism, if the charges publicly made are substantiated. The case is briefly this: A customer charges that he took a prescription to the drug store, and that in compounding it the clerk employed excessive quantities of strychnine and belladonna, from the effects of which the patient nearly died, and is still disabled and prevented from pursuing his ordinary vocation. Aside from this incompetency and carelessness of the clerk, he charges further that the clerk is not possessed of a pharmacist's license, in accordance with the laws of the State. He asks damages of $10,000. In ordinary cases of carelessness in dispensing the responsibility can be laid alone upon the dispenser's shoulders, but in this instance the responsibility seems to go back farther, to the Board of Pharmacy, which should not have allowed an unregistered man to dispense. The outcome of the case will be watched with interest.

The Kings County Pharmaceutical Association has a rule in force which is commended to the attention and imitation of other bodies, of all kinds. It is that officers and committee members must do the work for which they are selected, or be bounced from their positions. Last week a vice-president and a trustee were reprimanded in this way for being too frequently absent from the meetings of the association. It would be a good thing if it were generally recognized that positions of this nature are not solely honorary, but are for service. The association under notice is not greatly troubled in this respect, for its officers and committees are workers, and this little hint just given is hardly needed.

A newspaper in Maine, in mentioning that a shop is to be established for the manufacture of sodium, imparts to its readers the very important and highly scientific information that "one of the peculiarities of sodium is that it will burn water and make a blaze."

Registration of pharmacists in Nebraska is conducted in a little different manner from that obtaining in other States. There is a Board of Examiners who conduct the examinations and report the results to the State Board of Pharmacy, which latter is the licensing power. Ordinarily this arrangement works without friction, but there has just come to attention a case which has caused a little difficulty. The Board of Examiners refused to permit a certain doctor to take the examination, on the ground that he had not worked under a pharmacist for three years, as required by the law. The doctor was able to show that he had kept his own drugs and filled his own prescriptions for more than the required three years, and he appealed to the board to reverse the decision of the examiners. Upon his representations the board ordered that he be allowed to take the examination.

Patience sometimes ceases to be a virtue, and it is made the harder when accompanied with the exasperation which always attaches to the knowledge of having been cheated. Thus we can easily understand the frame of mind and sympathize with the feelings, of the editor of a Michigan paper who publishes the following notice:

FOR SALE CHEAP.

An account for advertising against the ——— Remedy Company, of Chicago, amounting to $6.33. Reason for selling is that after repeated efforts to collect the bill and failing each time, we have concluded an account against this firm is No Good, unless some one should get it who can, by some manner unknown to us, make them pay the account.

The advocates of sarsaparilla as a spring tonic have always dwelt upon the fact that it is "purely vegetable," containing no mercury or other mineral poisons, etc. But there is such a thing as getting a sarsaparilla that is too purely vegetable, as a Maine barber found to his cost, when he bought nine bottles of sarsaparilla for $2, marked down from 50 cents a bottle, from a traveling doctor, the preparation proving later to have been made by the seller by steeping grass in a tin pail which he had borrowed from a farmer. We do not hint at the moral in this little tale, for it is plainly apparent, nor would we enter into a discussion of the relative merits of this concoction and sarsaparilla.

What is sauce for the goose is sauce for the gander, so thinks a Michigan druggist who has been charged with the illegal sale of liquor. He has caused the arrest of a customer on the charge of obtaining the liquor under false pretenses, and the patron has been found guilty and given thirty days in the county jail. The goose druggist intends to measure out the same sort of sauce to other gander customers. Not a bad plan, when spotters and all sorts of disreputable individuals and methods are employed to secure evidence against druggists by false pretenses and lying misrepresentations.

The recent spurt of activity on the part of several State boards of pharmacy with regard to the prosecution of violators of the pharmacy law is both surprising and gratifying. All over the country prosecutions are being instituted against men who are conducting drug stores without being registered pharmacists, and, what is best of all, heavy fines are imposed in many cases. The courts are in better sympathy with boards of pharmacy in this work than they were a few years ago, for which let us all be thankful.

A citric acid factory is to be started in North Ontario, Cal., to make the product from the surplus crop of lemons. As the material from which is made all citric acid used in this country is now imported, the projectors of this domestic industry believe they can make a profitable thing of it.

Correspondence.

We are pleased to publish here communications from our readers on topics of interest to the drug trade. Writers are requested to express their views as briefly as possible. Each article must be signed by its writer, but his name will not be published if so requested.

THE QUEBEC EXAMINATIONS.

Montreal, Nov. 8.

To the Editor.

I am requested by the Council of the Pharmaceutical Association of the province of Quebec, to draw your attention to an article, from a Quebec correspondent, on page 651, in your issue of Oct. 28, in which some adverse criticisms are made regarding the recent major and minor examinations of this association, held in Quebec last month, and as an offset to these criticisms to enclose you a copy of the report of the Board of Examiners, and to draw your attention to that part of it referring to the subject upon which the candidates were examined as follows: "The candidates were submitted to a severe written and oral examination in chemistry and physics, materia medica and toxicology, botany, practical dispensing, reading of prescriptions, theoretical and practical pharmacy and weights and measures." In reference to the remarks of your correspondent to the primitive character of the arrangement for dispensing, I would say that these were in all respects, as adequate as the circumstances would admit, the dispensing cabinet he speaks of, being, when open, about 6 feet long and 3 feet high and furnished with all the necessary drugs, chemicals and dispensing apparatus that are required to test the qualifications of the candidates. As regards the examiners, they are all men of practical experience as pharmacists, and quite qualified to perform all the duties required of them, notwithstanding the opinion of your correspondent, who, for aught we know, may be one of the disappointed candidates. The small percentage of candidates who passed at the examination referred to shows the severity of the examination and the strictness of the examiners in correcting the candidates' written papers, these being considered the test of the candidates' theoretical knowledge. Trusting you will publish in your next issue the copies of the questions which I now send you, also the examiners' report of the results and this letter, I remain, yours truly, E. MUIR.

Secretary-Registrar.

[We are pleased to print the above, to offset any error that our news correspondent may have committed. We cannot give space to the questions, however, nor would any end be secured by their publication. They seem as a whole to bear out Mr. Muir's contention that they are good, practical questions, reasonably well adapted to test the applicant's qualifications. From an editor's standpoint, however, they are defective, especially in spelling—"deffination," "torrification," etc., for example. They cover the following branches:

Major—Materia medica and toxicology, botany, chemistry, pharmacy; 6 questions on each subject.

Minor—Materia medica, chemistry, pharmacy, prescriptions and toxicology; 6 questions each.—Ed. Era.]

THE EARLY CLOSING OF DRUG STORES.

Drug Store, Fourth and Brown streets,

Philadelphia, Pa., Nov. 12, 1897.

To the Editor of the Pharmaceutical Era.

I notice that of late the early closing of the stores is ventilated again. Allow me to point out what to me seems the only feasible plan. The chief trouble is that emergency cases will always arise, which must be provided for, and an absolutely hermetical closing of all the stores in a given locality is therefore impracticable. Another quite insuperable drawback is the apparent impossibility of pharmacists in a body to agree to do, or not to do, a certain thing—and then to stand by their agreement! Such a thing as a strike, by the way, of clerks is impossible; there is not sufficient "esprit de corps" among pharmacists. This was shown here in Philadelphia some twenty years ago, when nearly all pharmacists agreed from a certain date to close at, say, 9 o'clock. The very first night the more conscientious ones did put out the lights in the windows, preparatory to closing. When 9 o'clock came some of them began to put up the shutters; most of them, however, stood in the door watching their neighbors. The inevitable result followed: Nobody wanted to be the first to close, and the closing did not begin before the time-honored 11 o'clock! That was the end of it.

Now for my plan, which, by the way, is not mine, but borrowed from the French. While in Lyons (France) in 1857, I noticed that at night so few stores were open. On inquiry, I found that this was their way of solving the early closing question. (Whether said plan is still followed, or whether it was more or less short-lived, I do not know.)

Take a map of the city, mark the location of all the drug stores, and number them consecutively, starting from a convenient point in the outskirts. Now let it be agreed that on Mondays, Wednesdays and Fridays the stores with uneven numbers close at 9 o'clock, while the even numbers keep open as long as they choose. The stores with even numbers will then close early on Tuesdays, Thursdays and Saturdays. Sundays both classes of stores may do as they choose. It is evident that local exigencies will necessitate some slight modifications in that particular neighborhood (for instance, stores near theatres). At first there will necessarily be a lot of grumbling, because business goes to "the other store," but that will all right itself in a short time. Since every store has a night clerk, his work begins with the closing, of course, whether he goes to bed right away, or has company, or a quiet game of cards, etc., is nobody's business; he is relieved of the necessity of staying in the store proper and attend to extraneous matter, as selling postage stamps, soda water, etc. This applies, too, to the proprietor who cannot afford to keep a clerk; every second night, after 9 o'clock he can take his ease, and only has to attend to the night bell.

I claim, that a plan on these lines, is the only possible practical solution of this much vexed and ventilated question. Yours, etc., HANS M. WILDER.

THE MATZOON CONTROVERSY.

Chicago, Ill., Nov. 8, 1897.

To the Editor—Since my arrival in America, 1890, "Matzoon," of whatever make it may be, has attracted my attention considerably.

"Matzoon," as prepared in almost every family throughout Armenia and Turkey, is some kind of fermented milk, either from a cow, goat, or a sheep, and is used simply as a relish and not as a medicinal food, though it may contain, to some extent, nitrogen.

The pronunciation of the word "Matzoon," as it is used in Armenia, is done by giving "a" its third voice, as in the word "are," and pronouncing "oo" in the usual way, as in "moon," and not "Maadzoon" as claimed by Dr. Dadirrian and as published in the Pharmaceutical Era, page 687, of Nov. 4, 1897. "Matzoon" is just as common a word for Armenians as is water for English speaking people.

"Matzoon" in its original state has the consistency of jelly, and contains butter, but by mixing it with sufficient water so as to convert it to a semi-liquid state, and churning, is deprived of its butter only (and not of its casein), and just about the same thickness and taste as is sold in drug stores of this "Country of Patent Medicines."

The Turkish word for "Matzoon" is "Yoghourd," and the words "taan" (Armenian), and "ayran" (Turkish), are the words used to designate "Matzoon" when liquified to the consistency of American "buttermilk."

As an Armenian and a pharmacist, I have made "Matzoon" in a very satisfactory way; but when anybody calls for a certain make of "Matzoon," he has to get it, but otherwise what I think is just as good.

According to my belief, when the Commissioner of Patents issued the privilege to Dr. Dadirrian, or "Y. T." Matzoon Co., he (the Commissioner of Patents), did not know it was ("Matzoon") part of the Armenian language, but thought it was a specific word as in most cases.

Dr. Dadirrian is seeking protection, through the courts of this country, for the word "Matzoon" and not for the preparation itself; but, as the word "Matzoon" is a common word and a part of the Armenian language, so, we Armenians have either to find some other word to replace the monopolized one, or to discover another language for ourselves. S. J. KANTZABEDIAN.

A GREAT MARKET FOR GINSENG.

The following is taken from the annual report of Consul Johnson, dated Amoy, China, July 29, 1897 (Consular Report):

I wish to call especial attention to an article now imported from the United States to a limited extent and from Korea—ginseng. It is a native of Colorado, Wyoming, Utah, as well as other mountainous districts of America,* also of Korea and Northern Asia. I do not exaggerate when I state that it is possible to market annually in China $20,000,000 worth of these roots. They are now being cultivated in the United States to a limited extent, and prices obtained by the grower are entirely out of proportion to those realized by the thrifty exporter. It sells in Amoy at a price from $25 to $35 (Mexican) per pound. It costs in America from $2 to $3 in gold or $4 to $6 in Mexican currency. Yet at these figures Amoy handled during 1896, 109,823 haikwan taels (or $88,517.34 in United States gold) worth of these roots from America alone. From Korea the value of 54,867 haikwan taels, or $44,222.80 (United States gold), was imported. The Korean article is much higher priced and more skilfully cured, although not otherwise superior in quality to the American product. It was formerly bought from the Americans by Chinese dealers at a few cents per pound, and is still regarded as a profitable crop. The discovery that the Chinese were making fortunes from these purchases caused an advance in the price; but the real facts and possibilities in this line seem never to have dawned upon the struggling farmers in the mountainous districts of the United States which are so well adapted to the growth of the plant. I have searched in vain for a report upon the subject which afforded any idea of the field open here for American enterprise. It seems to me that if our people realized that at least $3 in gold could be fairly demanded by the grower for every pound of well-cured roots, and that the market would be practically unlimited, a new mine of wealth, affording employment for a large population, would be opened.

The ginseng, a plant of the genus Aralia, somewhat resembles the horse-radish root. It grows wild in the mountains. The species A. Quinquefolium is the article of export. It is used as an invigorating tea by all the wealthy Chinese and as a medicine by the native physicians. It enters largely into the list of presents sent by the wealthy to friends and the articles exchanged between high officials. It is bought by the middle classes throughout the entire Empire, and even the poor peasants give up their hard-earned silver for this national panacea.

I hope that these facts will be brought to the attention of the chambers of commerce throughout the districts mentioned, in order not only that the possibilities may be, but that knowledge of prices may be disclosed, but that knowledge of the prices may be disseminated, to protect those who most need the benefits to be derived from the industry.

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*Including also West Virginia, Ohio and Minnesota.

The Era Course in Pharmacy

J. H. BEAL, Sc.D., Ph.G., Director.

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THE ERA COURSE IN PHARMACY is a thorough, practical and economical course of home study in pharmacy, and covers the subjects usually embraced in the curriculum in a standard college of pharmacy. It is designed for all who desire systematic instruction in pharmacy; for clerks who cannot attend college; for those preparing for pharmacy board examinations; as auxiliary course for students in college, and as a means of review for graduates and experienced pharmacists.

THE LECTURES are published weekly in THE PHARMACEUTICAL ERA, and the **QUIZZES** and **EXAMINATIONS** are conducted by mail. A separate question blank is issued on each lecture and sent to each matriculate, his answers are duly rated by the instructors and returned to the student with corrections and notations.

THE ENTIRE COURSE covers a period of two years and **DIPLOMAS** are issued to all passing final examinations. Each year is divided into two terms. The first term of the Junior year began September 2, 1897, and will end January 27, 1898; the second term will begin February 17, 1898, and end June 30, 1898. The junior class for 1897 is now closed.

FEES. The entire expense is only $7.75 per annum and includes subscription to the ERA, tuition fees and a binder for preserving copies and lectures.

LECTURE NO. 23.

Inorganic Chemistry.

The Oxygen Group—(Continued).

OXYGEN. SULFUR. SELENIUM. TELLURIUM.

SULFUR. (SULPHUR.)

Symbol S. Valence 2, 4, 6. Atomic Weight 31.98

Historical.—Sulfur has been known from the earliest times. The old name brimstone is from bernston or burning stone. The Latin name sulfur also refers to its combustible nature.

Natural Sources.—Sulfur occurs naturally in immense deposits in volcanic and hot spring regions, where it is probably formed by the mutual decomposition of sulfur dioxid and hydrogen sulfid, both gases generally accompanying volcanic phenomena.

$$SO_2 + 2H_2S = 3S + 2H_2O.$$

Sulfur also occurs in a large number of mineral compounds, as the sulfids of iron, lead, copper, zinc, arsenic and antimony, and the sulfates of calcium, barium, magnesium, sodium and iron. It is also a constituent of many vegetable and animal tissues, especially in the albuminous compounds.

Preparation.—Sulfur is never prepared for laboratory use. Crude sulfur is freed from earthy impurities by placing it in kilns and setting fire to the bottom of the mass. A portion of the sulfur in burning furnishes the heat necessary to melt the remainder, which is drawn off at the bottom, the impurities mostly remaining behind. It is also obtained from iron pyrites by heating to a high temperature in iron retorts, when a portion of the sulfur distills over.

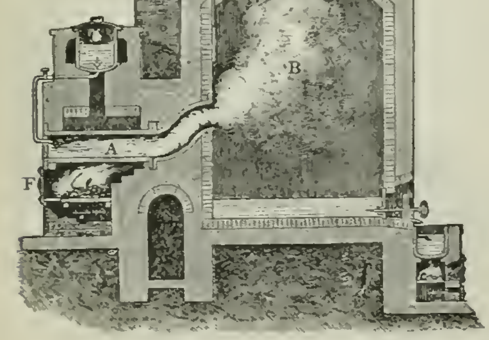

Fig. 26.—Purifying Sulfur by Sublimation.

However obtained, the crude sulfur is purified by distillation before it enters commerce. (Fig. 26.)

Description and Physical Properties.—As found in commerce it is in rolls generally known as roll brimstone, obtained by casting the melted substance in molds, or in the form of a bright yellow crystalline powder, known as sublimed sulfur or "flowers of sulfur," produced by the sudden condensation of the sulfur vapor when distilling. It is also seen in the form of a much finer powder of a lighter color, called precipitated or lac sulfur, and prepared by the decomposition of alkaline persulfids by means of a mineral acid. Sulfur is odorless, except when rubbed, nearly tasteless, and insoluble in water.

Several allotropic modifications of sulfur are known, the form depending considerably upon the temperature. At a temperature of about 115° C. it melts to a clear, yellow, mobile liquid which at about 200° C. to 250° C. becomes almost black, and so thick that it will not flow from the vessel when inverted. At about 330° C. it again becomes liquid, and at 440° boils, yielding a brownish-yellow vapor. If while in this highly heated condition it be suddenly cooled by pouring into cold water it is converted into a brown, translucent, elastic mass known as *plastic sulfur*, which gradually returns to the ordinary hard, yellow variety. The yellow variety also forms several distinct crystalline modifications, one of which is soluble, the other insoluble, in carbon disulfid. The soluble variety is found mainly in roll sulfur, and the insoluble in flowers of sulfur, though the two kinds are seldom separate. From its solution carbon disulfid sulfur crystallizes in rhombic octahedra, while the crystals formed from molten sulfur are monoclinic prisms.

Sulfur also presents certain anomalies in vapor density. At or near the boiling point the vapor density indicates the presence of six atoms in the molecule, and at a temperature of 860°, or above, of two atoms.

The yellow variety of sulfur is insoluble in water, slightly soluble in ether and alcohol, and freely soluble in petroleum, benzene, turpentine, carbon disulfid and similar liquids.

Uses.—Immense quantities of sulfur are used in the manufacture of sulfuric acid, in preparing sulfur dioxid for bleaching and disinfecting, in the manufacture of gunpowder, and for various other purposes in the practical arts. The sublimed article, when purified, and the precipitated sulfur still have a considerable place in medicine.

COMPOUNDS OF SULFUR.

Sulfur combines with a great number of elements. The most noteworthy compounds are the hydrogen and oxygen compounds, the sulfur acids, the halogen compounds, the various metallic sulfids and sulfates, and carbon disulfid.

Hydrogen Compounds.—With hydrogen sulfur forms two compounds, hydrogen sulfid, and hydrogen persulfid.

Hydrogen Sulfid, H_2S, also called sulfuretted hydrogen, hydrosulfuric acid, etc., is a colorless, sweet tasting gas, of a very repulsive odor resembling that of rotten eggs. At a pressure of 17 atmospheres it condenses to a colorless, mobile liquid. Water at ordinary temperatures dissolves about three times its volume of the gas. This solution is sometimes used as a reagent, but is unstable and gradually decomposes with deposition of free sulfur.

Hydrogen sulfid is a constituent of volcanic gases, and is found dissolved in many mineral waters, commonly known as sulfur waters. It is also a product of the decomposition of organic substances containing sulfur, as eggs, animal tissues, etc. It can be produced artificially in several ways, but is usually manufactured for laboratory use by the decomposition of a sulfid, generally ferrous sulfid, with dilute hydrochloric or sulfuric acid. A jet of the gas burns in the air with a blue flame, yielding sulfur dioxid and water. If mixed with air and ignited it is strongly explosive. It is poisonous when inhaled, and experiments with it should be performed under a hood with a strong draught, or in a well ventilated laboratory.

Hydrogen sulfid is a strong reducing agent, and when brought into contact with oxidizing agents is decomposed, its sulfur being set free, as follows:

$$2HNO_3 + 3H_2S = 3S + 2NO + 4H_2O.$$

Its principal use is as a reagent in the chemical laboratory, where it is used to precipitate the heavy metals from their solutions, with many of which it forms insoluble colored sulfids.

The Sulfids are the binary compounds of sulfur with other elements, and are generally looked upon as salts of hydrosulfuric acid. They may be prepared either by simply fusing the elements together, as in the manufacture of ferrous sulfid, or by passing hydrogen sulfid into a solution of a salt or hydroxid of a metal. The two following equations will illustrate:

$$Fe + S \text{ (fused)} = FeS.$$
$$HgCl_2 + H_2S = HgS + 2HCl.$$

The last method cannot be employed when the sulfid formed is soluble in the acid which is set free.

The sulfids are recognized by their yielding hydrogen sulfid when treated with dilute acids, and by the precipitates which their solutions produce when added to solutions of salts of the heavy metals.

Hydrogen Persulfid.—The substance known by this name is a heavy, oily, yellow liquid, consisting most likely of a mixture of polysulfids of hydrogen, as H_2S_2, H_2S_3, etc. It is very unstable and of but little importance.

Chlorids of Sulfur.—Three liquid chlorids of sulfur are known, the monochlorid, S_2Cl_2, the dichlorid, SCl_2, and the tetrachlorid, SCl_4.

The first is of importance because of its being the best known solvent for sulfur. The others are unstable and unimportant.

Bromin and Iodin Compounds.—Sulfur forms one bromid, S_2Br_2, and two iodids, SI_2 and SI_6. Sulfur moniodid, S_2I_2, is official in the U. S. P. under the title of *Sulfuris Iodidum*, and is prepared simply by fusing the two elements together.

Oxids and Oxygen Acids of Sulfur.—Four oxids of sulfur are known, the sesquioxid, S_2O_3; the dioxid, SO_2; the trioxid, SO_3, and the heptoxid, S_2O_7. Only the second and third need to be considered.

Sulfur Dioxid SO_2, occurs naturally in volcanic gases. It is formed whenever sulfur is burned in air, but is usually prepared for experimental purposes by the reducing action of certain metals, or of charcoal, on concentrated sulfuric acid.

$$Cu + 2H_2SO_4 = CuSO_4 + SO_2 + 2H_2O.$$

It is a colorless, heavy gas, possessing the suffocating odor of burning sulfur, freely soluble in water, and condensible by cold and pressure to a colorless mobile liquid. Its chief importance depends upon the property which it possesses of decolorizing many organic substances, which makes it important as a bleaching agent, and also of destroying bacteria, and therefore valuable as an antiseptic and disinfectant. Like chlorin, it is effective for these purposes only in the presence of water, but unlike chlorin its action is one of reduction instead of oxidation, the hydrogen which is set free acting as the reducing agent.

Sulfur trioxid when pure is a snow-white solid, or in transparent, colorless crystals. It may be prepared by the direct oxidation of the dioxid or by the distillation of fuming sulfuric acid. Its most remarkable property is its affinity for moisture, which it attracts with so much avidity that it soon liquefies when exposed to the atmosphere.

Sulfurous Acid, H_2SO_3.—This acid is formed when sulfurous anhydrid is dissolved in water.

$$SO_2 + H_2O = H_2SO_3.$$

An aqueous solution containing not less than 6.4 per cent. by weight of sulfur dioxid constitutes the *Acidum Sulphurosum* of the U. S. P. The solution possesses the odor and bleaching properties of the gas.

On exposure to the air sulfurous acid gradually combines with oxygen to form sulfuric acid, so that nearly all of its solutions contain more or less of the latter compound.

The salts of sulfurous acid, the sulfites, are an important class of compounds, useful both in the arts and in medicine, their chief value lying in their ability to release sulfur dioxid when treated with an acid. This reaction also serves to detect them in the process of analysis.

Sulfuric Acid, H_2SO_4.—This is a colorless, heavy, oily liquid formerly called *oil of vitriol*, because first obtained by the distillation of green vitriol.

The *Acidum Sulphuricum* of the Pharmacopœia contains 92.5 per cent. of the absolute acid, and has a specific gravity of 1.835. It can be prepared like sulfurous acid, by dissolving the corresponding anhydrid in water.

$$SO_3 + H_2O = H_2\ SO_4.$$

On the commercial scale it is manufactured by passing into large leaden chambers, sulfur dioxid, obtained by burning sulfur, steam, air, and nitric acid, or certain oxids of nitrogen. (Fig. 27.) The sulfur dioxid cannot readily take up oxygen from the air, but can easily take

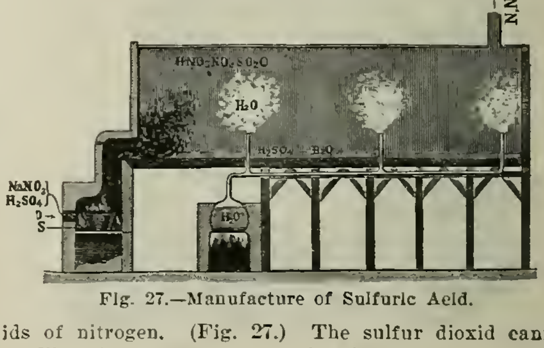

Fig. 27.—Manufacture of Sulfuric Acid.

it from the nitric acid or the nitrogen oxids which are present. The latter in turn take up fresh oxygen from the air, and thus act as carriers of oxygen from the air to the sulfur. The completed reaction may be represented by the following equation, though it is quite certain that intermediate reactions occur:

$$3H_2SO_3 + 2HNO_3 = 3H_2SO_4 + 2NO + H_2O.$$

The weak acid of the chambers is first concentrated in leaden and then in platinum vessels, and finally purified by distillation from platinum stills.

Sulfuric acid is probably the most important acid known. It is used in the preparation of many other acids, and in a large number of other chemical operations. Enormous quantities of it are consumed yearly.

The concentrated acid has a great affinity for water, mixing with it with the evolution of considerable heat. For this reason the two should be mixed only in small quantities at a time, and by *adding the acid to the water*, never the reverse. If these precautions are neglected dangerous explosions are liable to occur from the suddenly generated steam. The concentrated acid chars a large number of organic substances by abstracting the elements of water from them.

The salts of sulfuric acid, the sulfates, are an important class of compounds, and are used in both the arts and in medicine. Among the most important may be named ferrous sulfate, or green vitriol; cupric sulfate, or blue vitriol; alum, a double sulfate of aluminum and an alkali, etc.

Nearly all of the sulfates are soluble in water, those of barium, strontium, and lead being exceptions. Calcium sulfate, or "plaster of Paris," is sparingly soluble. The most characteristic reaction of a soluble sulfate is the formation of a white precipitate with a barium salt, insoluble in acids.

Thiosulfuric Acid, $H_2S_2O_3$.—This acid, formerly known as hyposulfurous acid, is very unstable and is better known by its salts, the thiosulfates. Sodium thiosulfate is recognized by the U. S. P. under its old title, sodium hyposulphite. It is prepared by boiling together a solution of sodium sulfite with flowers of sulfur, and is much used in photography because of its power of dissolving silver salts, and in analysis as a reducing agent.

When a thiosulfate is treated with a mineral acid, thiosulfuric acid is first released, and then quickly splits up into sulfur dioxid, free sulfur and water, thus:

$$Na_2S_2O_3 + 2HCl = 2NaCl + H_2S_2O_3,\text{ and}$$
$$H_2S_2O_3 = SO_2 + S + H_2O.$$

This reaction may be made use of as a test for the identification of a thiosulfate, the precipitate of sulfur serving to distinguish it from a sulfite, which also yields sulfur dioxid when treated with hydrochloric acid.

Another characteristic reaction of a thiosulfate is its power of decolorizing solutions of iodin, often taken advantage of in preparing the so-called "colorless tincture of iodin," which consists of a mixture of sodium iodid and tetrathionate, formed according to the following equation:

$$2Na_2S_2O_3 + 2I = 2NaI + Na_2S_4O_6.$$

The Thionic Acids.—Another series of oxygen acids of sulfur are known as the *thionic acids*, differing from each other in the amount of sulfur they contain. The special title of the series is derived from *theion*, the Greek name for sulfur. Their formulas and titles are as follows:

$H_2S_2O_6$ Dithionic Acid.
$H_2S_3O_6$ Trithionic Acid.
$H_2S_4O_6$ Tetrathionic Acid.
$H_2S_5O_6$ Pentathionic Acid.

Carbon Disulfid, CS_2.—This compound is formed by passing the vapor of sulfur over red-hot charcoal contained in iron or earthenware cylinders, and condensing the product.

It is a colorless, very mobile, volatile, and strongly refractive liquid. The commercial substance possesses a very disagreeable smell, due to the presence of other sulfur compounds, but when perfectly pure it has a sweetish, ethereal odor. It is practically insoluble in water, but mixes readily with absolute alcohol, chloroform, and ether. It is an excellent solvent for rubber, sulfur, and the fixed and volatile oils, and is much used for this purpose.

Its vapor is poisonous, and when mixed with air, explosive. It is easily inflammable, burning with a blue flame, and forming vapors of the dioxids of carbon and sulfur.

PRACTICAL STUDIES.

1. Place about 10 to 20 grams of sulfur in powder in a test tube or crucible and heat gradually. Note carefully the different stages of mobility and color. When the liquid begins to boil, pour into cold water, and examine the character of the cooled mass. Preserve several days and note any changes which may have occurred.

2. In a small flask or test tube, provided with a delivery tube, place 5 to 10 Gm. ferrous sulfid in coarse powder, add about five times as much water as was used of the sulfid, and then carefully pour in strong sulfuric acid until active effervescence sets in. Do not use an excess of acid. Insert the delivery tube.

3. Hold a piece of moistened blue litmus paper in the gas. What occurs? The gas being still actively evolved, ignite the issuing stream of gas. Observe the color of the flame and the odor of the evolved gas. Balance the equation:

$$H_2S + O = SO_2 + H_2O.$$

4. Having extinguished the flame, pass the gas into a dilute solution of lead acetate contained in another tube. (Fig. 28.) What is the substance formed? Balance the equation:

$$Pb(C_2H_3O_2)_2 + H_2S = PbS + HC_2\,H_3O_2.$$

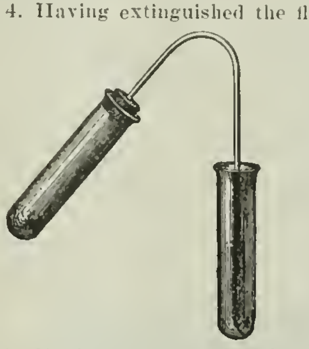

Fig. 28.—Students' Generator for Hydrogen Sulfid.

5. By means of a pine splinter hold a small portion of sulfur in a flame until it ignites. Judging from the odor evolved, what compound is produced Hold a moistened slip of litmus paper in the fumes. What is the result? Represent the burning by an equation.

6. In a test tube place some copper foil or filings, cover with concentrated sulfuric acid. When sulfur dioxid begins to be given off hold in the tube a slip of colored calico, first dry and then after moistening. Why is the color changed in the second instance and not in the first?

7. Make a solution of sulfurous acid by acidulating a moderately strong solution of sodium sulfite with hydrochloric acid. Sodium chlorid will also be formed, but does not affect the reactions. Add to the liquid a few drops of a moderately dilute solution of potassium permanganate. What takes place?

8. Add a few drops of sulfuric acid to about ten times its volume of water, and to this add a small portion of a solution of barium chlorid. What takes place? What is the white precipitate produced? Write the equation.

9. Make a solution of sodium thiosulfate. Acidulate with hydrochloric or sulfuric acid. Observe the mixture closely. Does it change in odor or appearance? Explain by equations.

Add a fresh portion of the thiosulfate solution to some tincture or solution of iodin. What occurs?

10. Examine the odor and appearance of some carbon disulfid. Place one or two Cc. in a test tube, add about 10 Cc. of water and heat, using a test tube holder. When the liquid begins to boil bring the mouth of the tube to the flame. Note the odor of the flame. Hold a moist piece of blue litmus paper in the flame.

Balance the equation:

$$CS_2 + O = CO_2 + SO_2.$$

LECTURE No. 24.

Pharmaceutical Physics.

Light—(Continued).

The practical application of light and of optical instruments to the purposes of every-day life, as well as to the necessities of the arts and sciences, are so numerous and of such vast importance that a brief description of all of them would fill many volumes. Nevertheless a few of these applications are of such special usefulness to the pharmacist in his determination of the purity and genuineness of the medicines which he dispenses to the public, as to be deserving of at least a passing mention.

The optical instruments which are of greatest use to the pharmaceutical chemist are the Microscope, the Spectroscope, and the Polariscope.

The Microscope.—The simple microscope, consisting of a single biconvex lens fastened in a suitable mounting, and giving a virtual, erect, and enlarged image of the object looked at, has already been sufficiently described.

If the image formed by a single lens of this sort be again magnified by a second lens placed at a distance above it, the arrangement, together with the supporting and adjusting mechanism, constitutes the *Compound Microscope*. As the construction of this instrument in its modern form is quite complex, and requires for its successful manipulation a special technique, a more complete description is reserved for a separate list of papers to be presented at a later date.

The Spectroscope.—A simple form of spectroscope, like that shown in the engraving (Fig. 76) consists of a prism of flint glass placed at the axis of the instrument. At one side is a *collimator tube*, having at the end next the gas burner an adjustable slit and at the opposite end a convex lens to direct a bundle of parallel rays from the slit upon the prism. Opposite the collimator is a telescope for viewing the spectrum produced, and between these is a third tube with an independent source of light, by means of which an engraved scale of fine lines is projected upon the prism and reflected thence into the telescope.

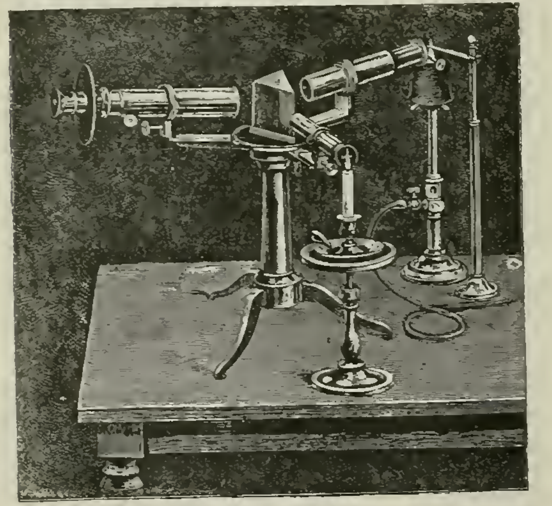

Fig. 76.—The Spectroscope.

Continuous Spectra.—If the gas burner be removed and a beam of sunlight reflected from a white cloud or from a white wall be permitted to enter the slit of the collimator the solar spectrum will appear to an observer at the telescope, along with an image of the engraved scale. Such a spectrum is known as a *continuous spectrum.* If instead of a beam of sunlight, light from any ordinary source of illumination be used, as from an incandescent electric lamp, platinum wire, or from a gas or candle flame, the same spectrum will appear. The same result will follow if the light from any other luminous solid or liquid be examined. Hence the law that *all luminous solids and liquids give continuous spectra.*

It should be noted in this connection that the luminosity of a gas or lamp flame is due to the incandescence of solid particles of carbon in the flame.

Bright Line Spectra.—If the bunsen burner, giving a non-luminous and nearly colorless flame, be replaced in front of the collimator slit and a platinum wire loop, wet with a strong solution of sodium chlorid be held in the flame, the latter will be colored an intense yellow, and an observer at the telescope will behold a very bright yellow line projected on a dark ground. If the wire be cleaned perfectly, and the experiment is repeated with a solution of potassium salt, a bright red line, and possibly a violet line, will appear. In like manner a lithium compound will yield a carmine colored flame, and show a bright red, and a fainter orange line. Strontium salts color the flame crimson, and show lines in the red, orange and violet portions of the spectrum.

These bright colored lines are due to the volatilization of the metals contained in the compounds used, and are produced by all gases heated to incandescence, or, *all incandescent gases give bright line spectra.* No two gases are known to give the same colored lines, arranged in the same order.

Under very great pressure, an incandescent gas may give a continuous spectrum, like an incandescent liquid.

Elements which are not volatile at the temperature of a bunsen flame, as iron or copper, may be vaporized, and the vapor made incandescent by passing an electric spark between poles consisting of the elements, when their characteristic spectra appear.

Dark Line Spectra.—If a brilliant beam of calcium light or sunlight, be caused to pass through a bunsen flame colored by a sodium salt, a new effect is produced. Instead of the yellow line produced by the sodium light alone there appears a single dark line located in the same position. If instead of sodium, lithium, strontium, potassium, or any other bright line producing substance be used, the bright lines in each case will be replaced by dark lines. In other words, *substances when in the state of vapor have the power of absorbing, or "sifting out" the same rays they themselves produce when luminous.*

The dark lines in each case are not really without light, but only appear so by contrast with the other more strongly illuminated portions of the spectrum.

Since these dark lines are produced by the absorption of certain light rays by the media through which they are passed, such spectra are known as *absorption spectra*, or because they are the reverse of the bright lines, as reversed spectra.

In like manner, many liquids and solids when light is passed through them give absorption spectra consisting of dark bands.

Spectrum Analysis.—From what has been said concerning the various kinds of spectra it is evident that the spectroscope affords us an important means of investigation concerning the nature and constitution of bodies. For example, as the sun gives a continuous spectrum, it must contain a nucleus of incandescent liquid or solid matter, and since this spectrum is crossed by numerous dark lines, it is evident that its central portion must be surrounded by a gaseous envelope containing the elements corresponding to those dark lines. Similar facts may be learned from the examination of comets, nebulae, the fixed stars, and other heavenly bodies.

With regard to the minuteness of the quantities of different substances which can be detected, no purely chemical tests can begin to compare in delicacy with the results of the spectroscope. It is stated, for example, that the one fourteen millionth of a milligram of sodium may be detected in the flame of a bunsen burner, or if the vapor be rendered luminous by the electric spark, the reaction becomes still more delicate. So also by combining the microscope and spectroscope, as in the microspectroscope, a single blood corpuscle will serve to give the characteristic absorption spectra of blood.

It was by the use of the spectroscope that Bunsen, its inventor, discovered the elements rubidium and cæsium, to which later investigators have added the elements thallium, indium, gallium and germanium, while by its assistance numerous important facts regarding many other elements have been brought to light.

The Polarimeter.—A simple form of polariscope and the theory of its action has already been described. One of the most important forms of this instrument is the *saccharimeter*, employed to test the strength of sugar solutions, and depends for its usefulness upon the fact that such solutions have the property of turning a beam of polarized light to the right, the amount of rotation depending upon the concentration of the solution. The nicols at each end having been crossed, a tube of known length is filled with the solution and introduced between the two prisms, when on looking through the analyzer the field will have become bright again. By rotating the analyzer through a certain number of degrees, depending upon the amount of sugar present, the field again becomes dark.

Other modifications of the polarimeter may be used in a similar manner to determine the character of many medicinal and pharmaceutical substances, as the essential oils, etc.

MAGNETISM.

Natural and Artificial Magnets.—Since very early times it has been known that a certain heavy, black mineral had the power of attracting small pieces of iron, and of assuming a north and south direction when suspended freely in the air. To this mineral, a peculiar oxid of iron, the Greeks gave the name *Magnes*, probably from Magnesia, the title of an ancient city of Asia Minor, near which the substance was first obtained. The old English name for this natural magnet was *lodestone*, which was derived from a still older Anglo-Saxon word, meaning to lead or draw.

Artificial magnets are pieces of iron or steel which have been made magnetic by passing an electric current around them, or by bringing them in contact with a natural magnet, or with another artificial magnet previously prepared in one of these ways.

Artificial magnets made of soft iron lose their magnetism as soon as the influence of the electric current or other magnet is withdrawn, and are therefore denominated *temporary magnets* to distinguish them from the *permanent magnets* made of hardened steel.

Polarity of Magnets.—A magnet suspended so that it can turn freely, as a compass needle, takes a position pointing approximately north and south. If the magnet be turned around until the north end points south, it will immediately reverse itself on being released, showing that one end only is attracted to the north and the other to the south. If the magnet be dipped into fine iron filings the latter will arrange themselves in radiating bunches at each end, while none are attracted at the middle portion. (Fig. 77.)

Fig. 77.—Magnet and Iron Filings.

Because of these and similar phenomena, a magnet is said to possess *polarity*, and the two attracting ends are called *poles*.

These two poles are inseparable from a magnet. If a large magnet be broken into pieces, each one of its fragments is found to also possess two poles; and if these small magnets are reunited their intermediate poles disappear and the two original poles reappear.

In order to distinguish between the two ends of a magnet it has been customary to call that pole which points north the north pole, and the other the south pole, but as we shall see later, this leads to an inconsistency in naming the magnetic poles of the earth. For this reason it is better to term the north seeking end the + or positive pole, and the other the — or negative pole.

Magnetic Transparency.—If a magnet be held on one side of a sheet of glass and a nail or other piece of iron be brought close to the other side it will stick fast, and can be made to follow the pole of the magnet as the latter is moved about. A thin board, book, or any other nonmagnetizable substance can be substituted for the glass with the same result. It thus appears that a magnet can act through non-magnetic matter, or that such matter is transparent to the magnetic force.

If the interposed substance be magnetizable, it will itself neutralize the force of the magnet, and prevent the latter from acting through it.

Magnetic Induction.—If a nail be tested while it is being attracted by a magnet either directly or through some other medium, it will be found to have acquired magnetic properties, which will continue as long as it is subject to the influence of the attracting magnet. When the latter is withdrawn, the nail loses its magnetism, unless it should be of steel, when, of course, it would remain a permanent magnet. A magnet formed in this way is known as an *induced magnet*, and the process as *induction*.

Law of Like and Unlike Poles.—If two magnets are freely suspended by threads, and their positive poles are brought together, repulsion will follow and the two magnets will be pushed apart. The same result is produced when their two negative poles are brought near each other. If, however, the positive pole of one be brought near the negative pole of the other, attraction will follow, and not repulsion. From these facts is deduced the so-called First Law of Magnets, that *like poles repel and unlike poles attract each other*.

Forms of Magnets.—Magnets may have any form, though the two most common are the straight bar, and the U shaped. The advantage of the latter is that both poles are thus able to exert their attractive powers upon the same object at the same time, and also that they so strengthen each other by mutual induction that a magnet of this form is able to lift a load three or four times as great as a bar magnet of the same weight.

It is found by experiment that the magnetism of a piece of steel does not penetrate very deeply beneath the surface, so that where a very strong permanent magnet is desired, it is better to magnetize thin strips of steel and afterwards bolt them together. (Fig. 78.) Such a combination is termed a *compound magnet*.

When not in use it is customary to keep a piece of soft iron called a keeper or armature attached to the poles of a magnet, to hold or bind its magnetism. Permanent magnets may have their magnetism lessened or destroyed in various ways: by being left without armature, by lying with the + pole pointing south, by jarring or hammering, by heating, etc.

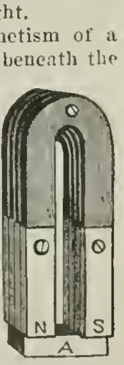

Fig. 78.—Compound Magnet with Armature.

The most powerful magnets are electro-magnets, made of soft iron, and surrounded by coils of wire through which strong electric currents are passed. These are, of course, temporary magnets, and are an essential part of the machinery employed in the generation or utilization of the electric current on a large scale.

Lines of Magnetic Force.—If fine iron filings are sifted on to a piece of glass covering a magnet and the glass gently tapped, the filings will be observed to arrange themselves in curved lines radiating from each pole. (Fig. 79.) If a sewing needle be rendered magnetic and suspended by a light thread and held over the glass it will everywhere tend to place itself parallel with the rows of filings. These lines are known as *lines of force*, and extend in every direction from each pole, showing that each is surrounded by a sphere-like region or *field* of magnetic force.

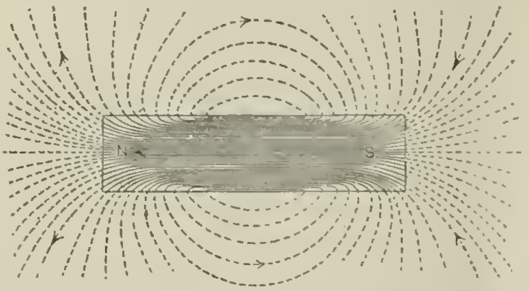

Fig. 79.—Diagram of Lines of Force.

The Second Law of Magnets.—Since the lines of force radiate in all directions it might be suspected that the law of inverse squares would apply. That this is the case, appears from the second law of magnets which is, that *the attractive force between two magnetic poles varies directly as the product of their respective strengths, and inversely as the square of the distance between them.* Doubling or trebling the strength of one of the magnets, would double or treble the force of their attraction; doubling or trebling their distance apart would reduce their attraction to one-fourth or one-ninth.

Diamagnetism and Paramagnetism.—Besides iron, only nickel and cobalt are sufficiently susceptible to magnetic attraction to be influenced perceptibly by magnets of ordinary powers. With the aid of sufficiently powerful electro-magnets, however, it can be shown that nearly all substances, and possibly all, are susceptible to a greater or less extent to magnetic influence. Some, like iron, nickel and cobalt, arrange themselves axially between the poles of a U magnet, and are known as *paramagnetic*. Others, like bismuth or oxygen, arrange themselves with their longer axis at right angles between the poles, and are said to be *diamagnetic*.

Amperian Theory of Magnetism.—The theory of Ampere assumes that about every molecule of a magnetizable body there is a current of electricity circulating continuously and without resistance, in consequence of which each molecule must be a magnet. In an unmagnetized iron or steel bar, however, the molecules are arranged promiscuously, so that their currents oppose each other and their magnetic effect is neutralized. When a strong current is sent around the bar, or when the latter is subjected to the inductive action of a magnet, the molecules are pulled into such positions that the currents about them are rendered parallel, when the bar becomes a magnet.

If the bar is of steel, its molecules retain their parallelism after the inductive force is withdrawn, but if it is of soft iron, the molecules slip back into their old position, and the magnetism of the bar disappears. It is in consequence of this that steel is said to have greater *retentivity* than iron.

When the currents about the molecules have acquired the greatest degree of parallelism of which they are capable, the magnet is said to be *saturated*, i. e., that its magnetism is fully developed.

The Earth a Great Magnet.—From its action upon a magnetic needle we are led to believe that the earth is itself a great magnet, surrounded by lines of force, like the artificial magnets which we make.

If the direction of the needle be compared with the north star, it will be found that, in most places, it does not point to the true north, but east or west of it, or, in other words, that the magnetic north pole does not coincide with the geographical north pole, and therefore, that the magnetic meridians shown by the needle do not correspond with the terrestrial meridians. The angle between the magnetic meridian of any place and the geographical meridian is known as the *declination of the needle*, and varies from year to year, the magnetic meridians sweeping alternately eastward and westward in oscillations of long periods.

The north magnetic pole has been located in Boothia, north of Hudson Bay, and the south magnetic pole in Victoria Land, in the southern hemisphere.

Since only unlike poles attract each other, it follows that if we call the north seeking end of a magnet the north pole we should have to call the north magnetic pole of the earth a *south pole*, and the earth's south magnetic pole a *north pole*. This is the method adopted by the French, but it seems more reasonable to designate the poles by the terms positive and negative and thus avoid such inconsistency.

The magnetic needle not only varies from a true north and south line, but from the horizontal as well. This variation is known as the *dip of the needle*.

In the northern hemisphere the + end dips and at the magnetic north pole will point directly to the center of the earth. The same phenomenon is repeated in the southern hemisphere with the exception that it is the —pole which dips. On the magnetic equator the needle remains parallel to the horizon.

PRACTICAL STUDIES.

1. Obtain a cheap magnet and with it magnetize several steel knitting needles. Do this by placing one pole of the magnet in contact with the needle near the middle and drawing it slowly along the needle to the end. Repeat this several times, always using the same pole of the magnet and drawing it in the same direction.

2. Test the two needles upon each other and upon tacks or iron filings to determine if they have become magnetic.

3. Suspend the needles some distance apart so that they swing freely, and determine which end of each points north. Mark this end with a file. Now bring the two needles near together and prove the law of like and unlike poles.

4. Cover a magnet with a sheet of glass, and sprinkle over the latter some fine iron filings, jarring the glass lightly until the magnetic curves are produced.

5. Magnetize a fine sewing needle, suspend it by a fine thread, and move it about over the curved rows of filings. What direction does the needle assume with regard to the lines of force?

If you are subject to headaches you stand a chance of becoming the owner of a $60,000 mansion. How, you ask? We don't know exactly, save that the manufacturer of a new headache remedy proposes to give away such a home to some lucky purchaser of his product. Who the manufacturer is, where the house and full details of the scheme we leave to be disclosed in ads. This is a gift scheme with a vengeance.

The Maine Board of Pharmacy is among the most recent to inaugurate an active campaign, and proposes to investigate the proprietors of drug stores who are not registered and who do not employ registered clerks. It expects to find a lot of such in the State, especially in the larger cities.

(*Continued from page* 716, *Nov.* 11.)

THE CENTURY'S PROGRESS IN CHEMISTRY.*

BY HENRY SMITH WILLIAMS, M. D.

V.

Of course the atom itself was in no sense displaced, but Avogadro's law soon made it plain that the atom had often usurped territory that did not really belong to it. In many cases the chemists had supposed themselves dealing with atoms as units, where the true unit was the molecule. In the case of elementary gases, such as hydrogen and oxygen, for example, the law of equal numbers of molecules in equal spaces made it clear that the atoms do not exist isolated, as had been supposed. Since two volumes of hydrogen unite with one volume of oxygen to form two volumes of water vapor, the simplest mathematics show, in the light of Avogadro's law, not only that each molecule of water must contain two hydrogen atoms (a point previously in dispute), but that the original molecules of hydrogen and oxygen must have been composed in each case of two atoms—else how could one volume of oxygen supply an atom for every molecule of two volumes of water?

What, then, does this imply? Why, that the elementary atom has an avidity for other atoms, a longing for companionship, an "affinity"—call it what you will—which is bound to be satisfied if other atoms are in the neighborhood. Placed solely among atoms of its own kind, the oxygen atom seizes on a fellow oxygen atom, and in all their mad dancings these two mates cling together, possibly revolving about one another in miniature planetary orbits. Precisely the same thing occurs among the hydrogen atoms. But now suppose the various pairs of oxygen atoms come near the other pairs of hydrogen atoms (under proper conditions which need not detain us here), then each oxygen atom loses its attachment for its fellow, and flings itself madly into the circuit of one of the hydrogen couplets, and—presto!—there are only two molecules for every three there were before, and free oxygen and hydrogen have become water. The whole process, stated in chemical phraseology, is summed up in the statement that under the given conditions the oxygen atoms had a greater affinity for the hydrogen atoms than for one another.

As chemists studied the actions of various kinds of atoms, in regard to their unions with one another to form molecules, it gradually dawned upon them that not all elements are satisfied with the same number of companions. Some elements ask only one, and refuse to take more; while others link themselves, when occasion offers, with two, three, four, or more. Thus we saw that oxygen forsook a single atom of its own kind and linked itself with two atoms of hydrogen. Clearly, then, the oxygen atom, like a creature with two hands, is able to clutch two other atoms. But we have no proof that under any circumstances it could hold more than two. Its affinities seem satisfied when it has two bonds. But, on the other hand, the atom of nitrogen is able to hold three atoms of hydrogen, and does so in the molecule of ammonium (NH_3); while the carbon atom can hold four atoms of hydrogen or two atoms of oxygen.

Evidently then, one atom is not always equivalent to another atom of a different kind in combining powers. A recognition of this fact by Frankland about 1852, and its further investigation by others (notably A. Kekulé and A. S. Couper), led to the introduction of the word equivalent into chemical terminology in a new sense, and in particular to an understanding of the affinities or "valency" of different elements, which proved of the most fundamental importance. Thus it was shown that, of the four elements that enter most prominently into organic compounds, hydrogen can link itself with only a single bond to any other element—it has, so to speak, but a singlehand with which to grasp—while oxygen has capacity for two bonds, nitrogen for three (possibly for five), and carbon for four. The words monovalent, divalent, trivalent, tetravalent, etc., were coined to express this most important fact, and the various elements came to be known as monads, diads, triads, etc. Just why different elements should differ thus in valency no one as yet knows; it is an empirical fact that they do. And once the nature of any element has been determined as regards its valency, a most important insight into the possible behavior of that element has been secured. Thus a consideration of the fact that hydrogen is monovalent, while oxygen is divalent, makes it plain that we must expect to find no more than three compounds of these two elements, namely, $H—O—$ (written HO by the chemist, and called hydroxyl); $H—O—H$ (H_2O, or water), and $H—O—O—H$ (H_2O_2, or hydrogen peroxide). It will be observed that in the first of these compounds the atom of oxygen stands, so to speak, with one of its hands free, eagerly reaching out, therefore, for another companion, and hence, in the language of chemistry, forming an unstable compound. Again in the third compound, though all hands are clasped, yet one pair links oxygen with oxygen, and this also must be an unstable union, since the avidity of an atom for its own kind is relatively weak. Thus the well-known properties of hydrogen peroxide are explained, its easy decomposition, and the eagerness with which it seizes upon the elements of other compounds.

But the molecule of water, on the other hand, has its atoms arranged in a state of stable equilibrium, all their affinities being satisfied. Each hydrogen atom has satisfied its one affinity by clutching the oxygen atom; and the oxygen atom has both its bonds satisfied by clutching back at the two hydrogen atoms. Therefore the trio, linked in this close bond, have no tendency to reach out for any other companion, nor, indeed, any power to hold another should it thrust itself upon them. They form a "stable" compound, which under all ordinary circumstances will retain its identity as a molecule of water, even though the physical mass of which it is a part changes its condition from a solid to a gas—from ice to vapor.

But a consideration of this condition of stable equilibrium in the molecule at once suggests a new question: How can an aggregation of atoms, having all their affinities satisfied, take any further part in chemical reactions? Seemingly such a molecule, whatever its physical properties, must be chemically inert, incapable of any atomic readjustments. And so in point of fact it is, so long as its component atoms cling to one another unremittingly. But this, it appears, is precisely what the atoms are little prone to do. It seems that they are fickle to the last degree in their individual attachments, and are as prone to break away from bondage as they are to enter into it. Thus the oxygen atom which has just flung itself into the circuit of two hydrogen atoms, the next moment flings itself free again and seeks new companions. It is for all the world like the incessant change of partners in a rollicking dance.

This incessant dissolution and reformation of molecules in a substance which as a whole remains apparently unchanged, was first fully appreciated by Ste. Claire Deville, and by him named dissociation. It is a process which goes on much more actively in some compounds than in others, and very much more actively under some physical conditions (such as increase of temperature) than under others. But apparently no substances at ordinary temperatures, and no temperature above the absolute zero, are absolutely free from its disturbing influence. Hence it is that molecules having all the valency of their atoms fully satisfied do not lose their chemical activity—since each atom is momentarily free in the exchange of partners, and may seize upon different atoms from its former partners, if those it prefers are at hand.

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*Reprinted from Harper's Monthly Magazine, October, 1897. Copyrighted by Harper Bros.

While, however, an appreciation of this ceaseless activity of the atom is essential to a proper understanding of its chemical efficiency, yet from another point of view the "saturated" molecule—that is, the molecule whose atoms have their valency all satisfied—may be thought of as a relatively fixed or stable organism. Even though is may presently be torn down, it is for the time being a completed structure; and a consideration of the valency of its atoms gives the best clew that has hitherto been obtainable as to the character of its architecture. How important this matter of architecture of the molecule—of space relations of the atoms—may be was demonstrated as long ago as 1823, when Liebig and Wöhler proved, to the utter bewilderment of the chemical world, that two substances may have precisely the same chemical constitution—the same number and kind of atoms—and yet differ utterly in physical properties. The word isomerism was coined by Berzelius to express this anomalous condition of things, which seemed to negative the most fundamental truths of chemistry. Naming the condition by no means explained it, but the fact was made clear that something besides the mere number and kind of atoms is important in the architecture of a molecule. It became certain that atoms are not thrown together haphazard to build a molecule, any more than bricks are thrown together at random to form a house.

How delicate may be the gradations of architectural design in building a molecule was well illustrated about 1850, when Pasteur discovered that some carbon compounds—as certain sugars—can only be distinguished from one another, when in solution, by the fact of their twisting or polarizing a ray of light to the left or to the right respectively. But no inkling of an explanation of these strange variations of molecular structure came until the discovery of the law of valency. Then much of the mystery was cleared away; for it was plain that since each atom in a molecule can hold to itself only a fixed number of other atoms, complex molecules must have their atoms linked in definitive chains or groups. And it is equally plain that where the atoms are numerous, the exact plan of grouping may sometimes be susceptible of changes without doing violence to the law of valency. It is in such cases that isomerism is observed to occur.

By paying constant heed to this matter of the affinities, chemists are able to make diagrammatic pictures of the plan of architecture of any molecule whose composition is known. In the simple molecule of water (H_2O), for example, the two hydrogen atoms must have released one another before they could join the oxygen, and the manner of linking must apparently be that represented in the graphic formula H—O—H. With molecules composed of a large number of atoms, such graphic representations of the scheme of linking is of course increasingly difficult, yet, with the affinities for a guide, it is always possible. Of course no one supposes that such a formula, written in a single plane, can possibly represent the true architecture of the molecule; it is at best suggestive or diagrammatic rather than pictorial. Nevertheless it affords hints as to the structure of the molecule such as the fathers of chemistry would not have thought it possible ever to attain.

(To be Continued.)

PUMICESTONE USED FOR FILTERING PURPOSES.—Dr. W. Bersch recommends the use of pumicestone, in powder form, for filtering fine precipitates like calcium oxalate, barium sulphate, lead sulphate, etc. About 2 or 3 grains finely powdered pumicestone are used on each filter paper. As a rule the liquid runs through this filter perfectly clear. This method can be used both in the laboratory and on a large scale.

THE BEHRING LABORATORIES AT MARBURG *

By W. HARRISON MARTINDALE.

When one considers that not many years ago, within a few hundred yards of the present Hygienisches Institut at Marburg, Robert Bunsen rendered so much to physics and physical chemistry, and Frederich Wöhler and his friend Hermann Kolbe founded that endless science, organic chemistry, it is interesting to contemplate that Herr Geheimrath, Professor Dr. E. Behring, had made this ancient town the seat of his bacteriological researches and has helped to evolve a science in its infancy.[1]

As to Professor Behring himself, the name of this well-known professor—formerly staff surgeon—is a household word throughout the civilized world.

Professor Wernicke, whose name is known as Behring's joint-worker in the first researches on diphtheria antitoxin, is a rising man in hygiene and allied sciences, and is a recent arrival in Marburg, having come from Berlin as Professor Behring's substitute during the latter's temporary absence owing to illness. The professors are assisted by private assistants and demonstrators: of the former may be mentioned Dr. v. Lingesheim, Dr. Fr. Ransom, and Dr. Ruppel.

Dr. Ransom, formerly in practice at Cambridge, was kind enough to devote a few hours of his time to conducting me over the various departments, which I endeavor to describe. It should be understood that these institutes are solely for teaching and research purposes, and in no way do they represent the serum industry of Germany, which has assumed such gigantic proportions.

THE HYGIENE INSTITUTE—SERUM DEPARTMENT.

This portion of the Hygienic Institute is endowed with a special grant from the government. A building apart from the principal one contains the stables and the room in which injections of toxin and removals of blood are made. The neat appointments of this room were remarkable for their simplicity, the furniture consisting of a large weighing machine (for the animals under treatment are weighed regularly), a sink, a bench, and an arrangement in the center of the floor resembling parallel bars in form and height, the difference being that the sides are filled in with woodwork. The horses, led from the stables, are placed between these partitions, which guard the operators against injury from the animals. We passed into the stables, my guide remarking: "Yes, the horses require care; any accidental wound is treated with strict antiseptic precautions. The head attendant was trained at the Veterinary College in Berlin."

A general stir among the horses showed that the doctor's voice had been recognized. (A pair when "off treatment" may be seen harnessed to a phaeton—or sledge in the winter—and are indeed the finest pair in the town—that, however, *en passant*.)

Horses young and old are operated upon for the purpose of ascertaining the most suitable age for serum production, and in this matter, as in others, *semper tener aurcam mediam* has been found a good maxim, but even this, however, is not all-powerful, as the idiosyncrasies of the patient have to be taken into consideration.

Here were horses under treatment for tuberculosis serum, for tetanus serum, for plague serum, and an ox for tuberculosis. There is frequently a stock of goats and sheep in the stables, but this was not the case on the occasion of my visit. The animals were all in a flourishing condition with the exception of one small horse, who appeared languid and displayed a swelling on his side. The inoculation—cholera toxin—in this case, had been recently made, but the swelling produced, the doctor assured me, would have subsided by the following day, and the animal would be "well" again. The inoculations, either intravenous or subcutaneous, are continued with increasing amounts of the toxin until either the limit is reached, or a sample of the blood taken from the animal shows upon examination that the "worth" of the serum is sufficient to allow of a larger quantity of blood being removed from the animal.

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*Reprinted from Pharmaceutical Journal.

[1] Prof. Leech in his address to the British Medical Association at Montreal, said: "Prof. Behring, of Marburg, thinks that in the light of serum treatment all our older views must vanish. Cellular pathology, he says, has become unfruitful for therapeutics. It is vain to treat the organs which are affected. Serum treatment, if we may judge from the summary of his paper, which was read at the recent 'Congress für innere Medicin,' is alone efficient. If Behring's view as to its nature is correct, its study is almost outside the boundaries of pharmacology, for he holds that antitoxin is not a definite chemical compound, but a quality inherent in certain albuminous substances as magnetism is in the magnetic oxide of iron."

With regard to the limit of inoculation, this depends on two factors; firstly, the solubility of the toxin, and secondly, the fact that not more than a limited quantity of liquid can be injected under the skin at one inoculation. At Marburg more than 500 Cc. is not inserted. The horses show no great discomfort from the loss of blood, and after a rest of three or four weeks may be treated for the serum of another poison.

Furthermore, a loss of weight during the treatment does not occur, on the contrary, a gain in flesh is often observed.

From the stables we passed to the paddock—not an unnatural sequence—and here, again, were horses of all sizes and ages, resembling, as far as outward appearances went, ordinary horses, except that owing to their higher calling as "Serum Pferde," shoeing is not essential to their existence.

We now ascended to the laboratories. The first room we entered was the one in which the advanced students work, under direction of Herrn Geheimrath. Glass apparatus was in evidence in great variety. On one side of the room stood a row of incubators. These Brutschranke—incubating cupboards—reflect great credit upon the manufacturer. They are lined throughout with a shining copper-colored alloy.

The next room which we entered is known as "die Küche" or the kitchen, and in some respects it bore great resemblance to the domestic essential. The cook himself was clad in the orthodox white canvas overall from head to foot—orthodox for the reason that every member of the "Serumleute" dresses in this fashion from professors downwards to the stoker in the basement, whom we found burning the cotton-wool employed for closing flasks and test-tubes *secundum artem*. (The stone pots in which this refuse is brought down from the laboratories are then cleansed with a mixture of crude phenol and sulphuric acid.)

But to return to the cook—he was filling the Henneberger oven with flasks to be sterilized—these were dirty—had been used for tuberculosis cultures, etc., but before being washed it is necessary to kill the adherent bacilli, and this is affected by filling the flasks with water and subjecting them to superheated steam, passing from above downwards through the oven. By this means, all apparatus being treated strictly in this manner, it is impossible for any infection to be carried to the drains.

Cultivations in bouillon are made in short-necked 1,000 Cc. flasks. The flasks containing the peptonized beef liquor are sterilized by heating in the Henneberger on three successive days before being inoculated.

From the kitchen, passing through double doors, we entered the Brutzimmer or incubation room. This is an incubating cupboard on a large scale, and is heated by hot-water pipes. The heat is retained and light excluded by means of special covering of the walls, ceiling and floor.

Bacillus tuberculosis was being cultivated, emitting its curious odor, and the shelves ranged round the room contained about 3,000 flasks. A mercury regulator kept the temperature constant.

Dr. Ransom's room was the next we visited. He seemed to know the life-history of every white mouse on the table.

"That big one," he said, pointing to a fat, lively little chap, in a bowl with a dozen others, "I infected yesterday with sufficient tetanus toxin to kill 20,000 mice—not forgetting, of course, to mix with the poison a certain quantity of serum."

This seemed to speak well for the potency of the serum. On the window sill stood some cylinders containing rabbit intestine undergoing sterilization by lengthy exposure to the sun's rays, "for some experiments of my own," as the doctor confidentially told me in answer to my question.

A row of 150 Cc. cylinders contained samples of blood drawn the previous day from horses under treatment for tuberculosis serum.

"The serum," my guide remarked, "has separated beautifully, as you see; after pouring it off and filtering, if necessary, the 'worth' will be ascertained. If this 'worth' is above a certain standard the serum would be ready for sale, but this, of course, is not for trade purposes. All serum sold in Germany must have at least a fixed minimum antitoxin 'worth,' and this is controlled by Professor Ehrlich in the Government Control Station at Steglitz, near Berlin. The bottles emanating from this institution are sealed, and no serum may be sold except with this seal."

I was then shown a bottle of dry diphtheritic serum in the form of clear crisp gelatin-like pieces. One gramme of this contains 5,000 I. E. (Immunizations Einheiten-units of immunization).

But time pressing, we made for the professor's private room, consulting room would be no misnomer. His "patients" are the animals in the stalls below.

On his writing table were temperature charts headed "Pferd I," "Pferd II," etc. Rise of temperature was to be noticed following on each injection of toxin, but besides the temperatures, other details were registered, such as blood removal, reaction, swelling upon injection, etc. A duplicate chart-book is also kept.

In a room opposite, cages containing hens, rabbits, hares, guinea-pigs, etc., were to be found. Inoculated corpses are burnt in a fire for the purpose, a box of coal-scuttle shape with tongs being used for transport. In the basement is another large stock of small animals.

The Hygienic Institute.

This is laid out for teaching purposes for younger students, as well as for more advanced workers, whereas the Serum Abteilung is open only to advanced students, and for the purpose of original research.

The old hospital operating room with its expansive window, forms an excellent demonstration room. Here Professor Wernicke holds his practical classes (the building comprising the Hygienisches Institut, Serum Abteilung and Pharmakologisches Institut, was formerly the Chirurgische Klinik.)

After a hasty glance through the well-arranged departments, and a peep into the photographic dark room, fitted up with Röntgen ray apparatus, we left for

Professor Behring's Private Laboratory.

This delightful villa—the "Villa Sera," as the students call it—stands on the brow of the hill not far from the Schloss. A more ideal situation could not have been conceived, and on the other hand the white house, viewed from the valley, is far from being an eyesore. The same can be said of only a very few modern houses in Marburg.

Entering, we found Dr. Ruppel in his overall at work. Dr. Ruppel is a chemist and bacteriologist. He commenced "shop" immediately, conversing in a serum language of "m's" and "worths." In the meanwhile I took a look round and discovered a large dialyzer and a copper vacuum still, with a specially constructed cylindrical head to prevent frothing.

Dr. Ruppel finished his precipitation, and with a final satisfied whisk of the glass-rod came forward to demonstrate the first wonder of the villa. To evacuate an exsiccator it was merely necessary to connect the same by means of an India-rubber tube with a jet in the bench, which one would have imagined was a gas-jet, and to turn the tap. A rush of air was heard, and the exsiccator was emptied, as if by magic. This evacuation was effected in a few seconds, and is of course many times more handy and complete than that produced by a stream of water.

Electrical power is utilized to its utmost throughout the laboratory. At the side of the door were three buttons labelled respectively "Vacuum," "Exhaustor," and "Centrifuge." The power of the first had been shown without needing to communicate with the machine-room, as the vacuum happened to be "going." The doctor pressed the buttom for the second, and immediately the atmosphere in the room became fresher, and the entire building was ventilated by a rapid current of fresh air. This is of particular advantage when working with bacillus tuberculosis, as the odor produced by this individual gives one violent headaches.

After glancing at a number of other ingenious devices, we went down to the basement. Here stood a hydraulic press capable of exerting 500 atmospheres pressure. Here also was a Brutzimmer, similar to the one at the Hygienic Institute, and capable of holding flasks to the number of 2,400. A thermostat regulated immediately the slight change in temperature produced by the doors being opened.

In another room were noticed a mill for powdering, by means of revolving marbles in a drum-shaped porcelain vessel, a shaker for extraction purposes, both driven by electricity, and a glass-sided box with India-rubber gloves inserted in the ends for working with fine powders of a poisonous nature; filling bottles for example, or transferring from one vessel to another.

In yet another was an apparatus fitted with electroplated trays for drying serum *in vacuo*. After a few hours at 40° C. the serum originally poured into the trays is removed from the same in the form of a dry powder. This oven, which is provided with windows, was manufactured in Paris.

We were then conducted to the machine room, and arriving there could with difficulty hear ourselves speak. Here was the motor responsible for driving the large centrifugal machine, the exhaustor, and the vacuum. Here also was ice for sterilizing purposes, in course of preparation by the ammonia process.

Having thus seen some of the mechanism of this model laboratory, Dr. Ruppel invited us up to his rooms above, stopping as he went to point out an assistant inoculating fresh bouillon flasks from a parent culture.

"Yes," he said, "it is tedious work, but doing 250 a day one becomes expert—*nicht wahr, Herr Scholl?*"

The rooms into which we were ushered were originally Professor Behring's chambers during his bachelor days, and a more tastefully, one might almost say, artistically arranged little suite could not be imagined.

He now resides in a delightfully-equipped house in the Renthofstrasse. In his study at home I was pleased to find an engraving of Luke Fildes' "The Doctor," hung above his writing table.

Professor Behring hopes to make known some results shortly, in connection with bacillus tuberculosis—the all-absorbing study just now in the Villa Sera. The investigators have proofs at hand which are self-satisfying, but no secrets will be laid bare until results are obtained sufficient to convince the world.

"NOIR SOLIDE" is known as "steam black." It is a prepared dye and a chemical compound, some of the original elements of which are extract of logwood, and salts of chromium and alumina.

PHARMACY.

LOCUST-BEAN MEAL consists of locust beans which have been taken from the pod and crushed for convenience and economy of transportation. The meal is used in the manufacture of cattle food.

WATERPROOFING LEATHER.—A process for waterproofing leather has been patented in Germany and is reported in Scientific American. Dissolve beeswax in benzine to saturation and heat the solution in a water bath, then add about one-tenth of spermaceti in a melted state. For use warm the mass again in a water bath and apply warm with a brush or a pencil to the dry leather, which has likewise been suitably warmed.

TURKEY RED OIL, or alizarine assistant, is a chemical compound of sulphoricinoleic acid obtained from castor oil and soda, which compound is known as sulphoricinoleate of soda. The chemist adds that "the only castor oil ever present in Turkey red oil is that small portion which has escaped transformation during the process of manufacture, and is dissolved by the sulphoricinoleic acid and its salts."

ANTIPYRINE COMPOUNDS.—If concentrated solutions of antipyrine and pyrogallic acid are mixed, an oil separates which is pyrogallol-antipyrine, $C_6H_3(OH)_3C_{11}H_{12}N_2O$. It solidifies to a mass of colorless crystals, melting at 78°. A similar compound can be obtained of antipyrine and phloro-glucinol, which melts at 184°. If aqueous solutions of gallic acid and antipyrine are mixed, an oil is deposited, but this appears to be rather a solution than a true chemical combination, crystals of antipyrine appearing in the oil after a time.—Bull. Soc. Chim.; Br. & Col. Dr.

A PRIZE CLEANSER.—A prize offered by the Society of Arts for the best material for cleansing fabrics without discoloration or injury has been awarded to a preparation of which the potato is the base. Two good-sized potatoes are grated into a pint of water, strained through a coarse sieve into another vessel containing a pint of clear water and allowed to stand until thoroughly settled, when the clear liquid is poured off, and used to sponge materials, which are then washed in clean water, dried and ironed. The sediment can be used for cleansing carpets, etc.—Spatula.

QUERCITRON EXTRACT is a preparation of quercitron and alizarin in nearly equal proportions, suspended in an aqueous solution of sodium sulphate and zinc sulphite. A sample analyzed had, approximately, the following composition:

Water and sulphurous acid	70.98
Alizarin	10.42
Quercitron	10.42
Sodium sulphate Zinc sulphite	8.18
	100.00

GROUND PAPRICA was returned by the appraiser as a spice and was assessed with duty as such by the collector. The importers protested against such assessment, claiming that the merchandise should have been returned by the appraiser as herbs which have been advanced in value or condition by refining or grinding. The board at the hearing decided that ground paprica is a powdered substance produced from the Hungarian pepper plant, which bears a large red pod similar in appearance to our domestic red pepper, the substance in question being produced from the seeds and not from the leaves, stems, etc.

CHEMICAL GLASSWARE is such ware as is used in making observations and experiments in chemistry, mixing chemical compounds, and does not include articles or instruments which are used solely for therapeutical or surgical purposes. (From an opinion by General Appraiser Wilkinson.)

PRIMULINE BUFF is a preparation from quercitron which is the bark of the black oak, sometimes called dyer's oak. The latter is used for both tanning and dyeing, imparting to calicoes and cloths shades of yellow color. Primuline buff is a mixture of quercitron 80 per cent. and alizarine 20 per cent.

ATTAR OR OTTO OF ROSES of commerce is described by recognized authorities as a volatile and highly fragrant essential oil, made in Turkey and other Eastern countries, also in the south of France. It is produced from the finest varieties of roses, chiefly from the damask rose or Rosa Damascena, by distilling the leaves with water at a low temperature. The yield is very small, 150 pounds of the rose leaves giving less, generally, than an ounce of attar or otto. Attar of rose is of a yellowish color, is soluble in absolute alcohol and in acetic acid, and should congeal well in 5 minutes at a temperature of 54.5° F.

NEW MODE OF MANUFACTURING COLLODION.—According to a patented process by Schlumberger, it consists in dissolving the guncotton in ethyl alcohol or methyl alcohol, to which a small quantity of one of the following substances is added: Levulose acetic acid, chloric acid, or their alkali salts acid, lactic acid, hydrochloric acid, of their alkali salts or earth alkali salts or zinc salts soluble in alcohol, aldehydes of acetic acid and benzoic acid or their acetates, ether of alcohol, with the above named acids; picric acid and salicylic acid, nitrobenzene, chinoline, pyridine, urea, glycocol.—Scientific American.

PAINTS AND COLORS.—The line between colors and paints is not absolutely clear. Webster uses the words colors, paints, and pigments as synonyms, while the Century Dictionary defines paint as a "substance used in painting, composed of a dry coloring material intimately mixed with a liquid vehicle." In the trade the Board of Appraisers find a pronounced difference in the meanings of the two words. A leading domestic manufacturer and dealer in colors and paints describes paint as "a pigment to which has been added a flowing vehicle, such as water, turpentine, varnish, or chiefly, oil." Other experts in the trade indorsed this definition and said that "dry paint" is a misnomer, as there is no such thing.

OCHER.—The article "ocher" comprises a class of natural earths, either argillaceous or calcareous, tinted with ferric oxides of various colors, the chief use of which is as pigments by both painters and artists. The calcareous substances which enter into the composition of ochers consist principally of silica and alumina, but the presence of these components is not necessarily a test of the article. The predominant colors are yellow, red and brown. The phrase "ochery earths" means earths, argillaceous or calcareous, which resemble ocher or partake of its nature in composition and uses. The phrase as used in the tariff schedule is comprehensive enough to embrace all earths or clays colored by ferric oxides and capable of use as pigments.

COD AND COD LIVER OILS.—The former is what is commonly and commercially known as "cod oil for tanners' use." It is made from the unhealthy and putrid livers of codfish and allied species, with which the entrails and other refuse parts of the fish have been thrown, and allowed to undergo putrefaction. It is of a dark or brown cherry color, and is used for tanning leather and other industrial purposes, and is incapable of being refined so as to make what is known as "cod liver oil." The latter is a distinct kind of fish oil, and is so recognized in trade. It is made of the fresh or selected livers of the codfish, is of a light color generally, and is used chiefly as a medicine. (Abstract from an opinion by Somerville, General Appraiser, 12,378.—G. A. 1150.)

BURNT STARCH comes into market in small compact pieces, nearer black than brown, gummy in character, burnt almost to caramelization, and showing a readiness to deliquesce. It is said to be prepared by boiling starch in the presence of very dilute acid for a sufficient length of time until the whole becomes soluble. The mixture is then evaporated to dryness, the exposure to heat continued until the necessary temperature is arrived at, care being taken that it does not pass 280° to 300° F., or about 100° below the carbonizing point. In an importation of this substance some time ago it was returned by the appraiser as "coloring for brandy" and so assessed. Upon appeal the importer testified that burnt starch is not used as a coloring, but that it is used "simply for flavoring and giving the beer a milder taste, acting similar to glucose, and the dextrinous substance aids in keeping the head or froth on the beer, and enables it to stand better."

THE ATOMIC WEIGHT OF MAGNESIUM has recently been redetermined with great care by Prof. Richards and Mr. Parker, of Harvard, and an account of their results appears in the current numbers of the Proceedings of the American Academy of Sciences. Sci. Am. abstracts this report. The previous determinations of the atomic weight of this element showed a remarkable inconsistency until the year 1884, when Marignac recorded the results of a large number of closely concordant experiments pointing to the number 24.37. The accuracy of this number has now been confirmed by Messrs. Richards and Parker. The method selected, says Nature, was the analysis of magnesium chloride. The salt was prepared, with great precautions, from the double magnesium and ammonium chloride by heating in a current of dry hydrogen chloride; it was then transferred to a weighing tube, without the possibility of contact with moisture, and the chlorine precipitated by silver nitrate, either gravimetrically or volumetrically. The results of four series of very concordant experiments give the number 24.362 as the atomic weight of magnesium when oxygen is taken as 16.00 or 24.179 if oxygen be taken at 15.88.

DEVELOPMENT OF FRUIT FLAVORS.—Some very interesting and suggestive results have been obtained by Jacquemin, who finds that by the addition of the leaves of fruit trees which in themselves have no marked flavor, to saccharine solutions undergoing alcoholic fermentation, a very marked bouquet of the fruit is developed. Thus by immersing pear or apple tree leaves in a 10 or 15 per cent. solution of sugar, and adding a pure yeast, which by itself gave rise to no marked flavor, after fermentation a liquid was obtained which had a strong odor of pear or apple respectively and an excellent flavor, and on distillation gave an alcoholic distillate, in which this aroma was still more marked. Vine leaves act in a similar manner, and the author suggests that it may be possible to improve the bouquet of a poor vintage by the addition of some leaves during fermentation. It is noteworthy that the results are far more marked when the leaves employed are from trees in which the fruit is approaching maturity. The author infers that the flavors of fruits are due to a body elaborated in the leaves, possibly of a glucosidal nature, which is not transferred to the fruits until the latter approach maturity, and is then acted upon by the special ferments contained in the fruit juices and develops distinctive flavors. The matter would appear to be of considerable practical importance. (Comptes rendus; Pharm. Jour.)

SENSITIZED PAPER.—In an opinion rendered by General Appraiser Sharretts, of this port, some time ago, the following information as to what constitutes sensitized paper is quoted: The general use of sensitized paper is in reproducing a positive from a negative. The negative may have either been produced in the camera, or it may consist of mechanical drawing or tracing, as in the plans of an architect, which has black lines upon a white ground. The negative, whether a photographic negative or produced by drawing, is placed in a frame, the sensitized paper is placed below it, and is exposed to the rays of actinic light—that is to say, a light which produces chemical action, such as sunlight or electric light. The general type of sensitized paper is the silver paper used by photographers. This paper consists of plain paper which is impregnated with a solution of salts. The paper so impregnated is then floated upon a bath of a solution of nitrate of silver. The silver from the solution is then taken up and forms a compound with the salts in the paper and is thus rendered sensitized or sensitive to light. Photographers also use albumen paper, which is produced by floating plain paper upon a solution of white of eggs (which has a certain proportion of salts with it) instead of impregnating the paper with salts. This albumen paper is then floated upon a silver bath as above and becomes sensitized. There are many other forms of silver paper, one of which is gelatine paper, which has been sensitized by the nitrate of silver bath, but all forms of silver paper are very expensive. The action of chemical light, however, is so general that cheaper substances can be used in the place of silver for sensitizing paper; for instance, the salts of iron or salts of uranium may be used. For the purpose of producing a sensitized paper to be employed in reproducing mechanical drawings, salts of iron in some form or other is generally used. The principal type of such a sensitized paper is the ordinary "ferro-prussiate paper," or "blue print."

OIL OF MIRBANE.—Considerable information regarding this substance is given in an opinion rendered by General Appraiser Lunt in a case (12845.—G. A. 1441.) where the assessed duty on the merchandise (oil of mirbane) was the subject of protest by the importers. Oil of mirbane is also known in commerce and the arts as nitrobenzole, essence of mirbane, mirbane, and artificial oil of bitter almonds. In the words of the General Appraiser it is one of the numerous chemical compounds, the characteristic or dominating element of which is derived from coal tar as a commercial source. To produce it, benzole, a constituent and distillate of coal tar, is treated in a closed vessel or still with 2 parts of fuming nitric acid and 1 part of concentrated sulphuric acid. These acids are gradually added to the benzole with agitation, the nitric acid being applied slowly until red fumes appear. The end of the chemical reaction is indicated by the liquid becoming colorless or nearly so, and separating into two distinct strata on the addition of water. The nitrobenzole so precipitated is drawn off and purified or refined by distillation.

The several grades met with in commerce are known as "light," "heavy," and "very heavy," boiling respectively at 400° to 410° F., 410° to 428° F., and 430° to 455° F. "Mirbane" is a fancy name originally applied to nitrobenzole when it was first discovered and introduced to the public as "essence of mirbane." Large quantities are consumed by manufacturers of aniline colors and explosives, and the substance is very extensively used by perfumers and by soap-makers for perfuming toilet soaps. From the description of the method of its production the Board of General Appraisers decided that "it is a chemical compound, and an oil evolved or precipitated from benzole by chemical combination and reaction, and is not produced or extracted by distillation, therefore it is not in fact an oil distilled, expressed or rendered." In the finding of the court it is stated that natural essential oils are "products," while artificial essential oils are "preparations and chemical compounds." Coal tar preparations embrace chemical compounds of every variety, including alkalies, salts, acids and oils.

QUESTION BOX

The object of this department is to furnish our subscribers and their clerks with reliable and tried formulas and to discuss questions relating to practical pharmacy, prescription work, dispensing difficulties, etc.

Requests for information are not acknowledged by mail and ANONYMOUS COMMUNICATIONS RECEIVE NO ATTENTION; neither do we answer queries in this department from non-subscribers.

Correction.

In the formula for "antichloros," this journal, Oct. 21, 1897, page 598, read "acid arsenosi, 0.002 gram," instead of "acid arsenosi, 0.02 gram."

Spots on Cigar Wrappers.

(D. E. H.) See this journal, issues of July 9 and Aug. 6, 1896, pages 45 to 178, respectively, and April 15, 1897, page 453.

Removing Walnut Stains From the Hands.

(C. F. G.) Apply solution of chlorinated soda, or warm chlorine water. The application of a little solution of tartaric acid has also been recommended. At the end of the operation wash the hands thoroughly with soap and water, and apply a little perfumed lanoline or other cosmetic to soften the skin.

Red Coloring for Tooth Wash.

(W.) Solution of carmine, cochineal coloring and tincture of cudbear are all used for this purpose. The latter preparation is more particularly intended when a bright red tint or color is to be produced in acid liquids. Various shades of red are also imparted by the following coal tar colors: Fuchsin, acid fuchsin, roccellin, Bordeaux, ponceau, eosin, erythrosin and phloxin. We suggest you do a little experimenting. The coal tar colors named are said to be harmless in the quantities necessary to produce the colors desired.

Registration in Vermont.

(C. E. S.) The Vermont Pharmacy Law provides for two grades of licentiates. A pharmacist must be twenty-one years of age and have three years' experience before examination. Licentiates of other boards of pharmacy and graduates of legally incorporated colleges of pharmacy and medicine, are entitled to license without examination. The fee for examination and license is $5, and for a license on diploma or on certificate of another board, $1. Every licentiate must have his license recorded with the Secretary of State. For this there is an additional fee of 25 cents.

Perfume for Witch Hazel Cream.

(O. B. L.) The perfume most suitable for any preparation is almost wholly a question of individual taste. What may please you may be disliked by another. We give you two formulas and suggest you not only try them but do a little experimenting with others of your devising and report your results to this department for the benefit of other druggists:

(1)	Oil lavender	1 ounce
	Oil bergamot	1 ounce
	Oil lemon	1 ounce
	Oil cinnamon	½ dram
	Oil rosemary	1 dram
	Oil rose geranium	½ ounce
	Oil cloves	½ dram
	Alcohol, to	8 ounces
(2)	Oil lavender	1 dram
	Oil bergamot	1 dram
	Oil lemon	1 dram
	Oil neroli	½ dram
	Oil balm	15 minims
	Oil rose	10 minims
	Cologne spirits, to	8 ounces

Incorporate the desired quantity with the witch hazel cream.

Barbers' Hair Tonic.

(H. T. S.) See formulas under "hair tonic" elsewhere in this department. Here are some others:

(1)	Tincture of cantharides	3 fl. drams
	Tincture of capsicum	1 fl. dram
	Ammonia	2 fl. drams
	Glycerine	2 fl. drams
	Cologne water, enough to make	16 fl. drams
(2)	Tincture cantharides	4 drams
	Ammonia water	4 drams
	Rose water	2 ounces
	Glycerine	4 ounces
	Bay rum	9 ounces
(3)	Tincture capsicum	3 drams
	Tincture cantharides	3 drams
	Aromatic spirits ammonia	1½ ounces
	Oil lavender	1 dram
	Tincture cinchona	2 ounces
	Alcohol, to make	16 ounces

Lime Waler and Calomel.

(H. B. McC.) The equation showing the reaction between lime water and calomel is thus indicated:

$$Ca(OH)_2 + Hg_2Cl_2 = Hg_2O + CaCl_2 + H_2O.$$

The products formed are mercurous oxide, calcium chloride and water. This reaction is that which occurs in the preparation of "Lotio Nigra" or "Black Wash," of the N. F. (Lotio Hydrargyri Nigra, B. P.), and the directions given in that work should be closely followed. The calomel must be triturated with the lime water, or rather with the water. If it is introduced into the bottle and simply shaken up with the lime water, little lumps are formed which protect part of the calomel from the action of the calcium hydrate. Of course, this mixture should be well agitated whenever any of it is to be dispensed.

Iron Pyrophosphate and Phosphoric Acid.

(S. C. D.) is unable to make a satisfactory mixture of the following:

Strychnine sulphate	1 grain
Iron pyrophosphate, Quinine sulphate, of each	1 dram
Dilute phosphoric acid, Syrup of ginger, of each	2 ounces

The difficulty here arises from the fact that the Pharmacopœial dilute phosphoric acid is incompatible with pyrophosphate of iron. When combined, a gelatinous precipitate is produced. This precipitation may be avoided by using the same amount of dilute metaphosphoric acid of the N. F. (No. 7), which represents an equal acid strength of the dilute tribasic acid of the Pharmacopœia. It remains, however, for the prescriber to decide whether such change shall be made. For a discussion of this reaction at length, see this journal January 31, 1895, page 443.

Restoring Color to Spots in Black Cloth.

(J. E.) asks for a chemical process for restoring the color to spots made in black cloth by ordinary embalming fluid. He says he does not want to take any chances of ruining the garment by experimenting. Our correspondent fails to tell us the composition of what he calls "ordinary embalming fluid." As he must know, this is a very elastic expression, for what may be to him an ordinary preparation, may differ widely in composition from a preparation in common use for a similar purpose by another individual. However, if the stains have been caused by an acid (arsenous, salicylic, boric, thymic, etc., used in many preparations of this character), the coloring can probably be restored by soaking the stain in strong water of ammonia, followed by thorough sponging with water. This treatment, we think, will not injure the garment (a black coat). Try the water of ammonia on one of the spots where the results if unsuccessful will show but little.

Toilet Lotion.

(O. B. L.) We cannot give the formula for the article you name. A preparation used for a similar purpose is the following: Prepare a thick, almost jelly-like, infusion of flaxseed, and add to it 20 per cent. of its volume of glycerine, with which has been mixed sufficient salicylic acid to make the finished product contain 2 grains in each fluid ounce. Perfume according to taste. Here are two others:

(1) Dissolve 4 grains boracic acid in 8 ounces of water and macerate in the solution 1½ drams quince seed, bruised, for three hours. Strain and press through cloth, add two ounces glycerine, 3 ounces alcohol, 2 drams cologne water and sufficient rose water to make 1 pint. Finally add 10 grains carbolic acid and shake well.

(2) Dissolve 4 grains boracic acid in 8 ounces water; macerate 1½ drams quince seed, bruised, in the solution for three hours; strain and press through cloth; add 2 ounces of glycerine, 10 grains carbolic acid, 2 ounces glycerite of starch, and mix thoroughly. Then mix 2 fluid drams of cologne water, 20 drops oil of lavender, and 3 fluid ounces of alcohol; add the mucilage and again mix thoroughly. Finally make up with water to 1 pint.

Arnica Salve.

(W. A. S.)

(1)	Solid extract of arnica	120 grains
	Lard	14½ ounces
	Yellow wax	1½ ounces
	Hot water, sufficient.	

Dissolve the extract of arnica in the hot water, and thoroughly incorporate it with the lard and beeswax previously melted together.

(2)	Yellow wax	1½ ounces
	Petrolatum	14½ ounces
	Arnica flowers	4 ounces

Melt the wax, add the petrolatum, stir in the flowers, heat moderately for one hour, stirring frequently; strain and allow to cool.

(3)	Solid extract of arnica	2 ounces
	Resin cerate	16 ounces
	Vaseline	4 ounces
	Raisins (seedless)	16 ounces
	Fine-cut tobacco	1 ounce
	Water, sufficient.	

Boil the raisins and tobacco in 2 pints of water until they are exhausted; express the liquid and evaporate down to 8 ounces. Soften the arnica extract with a little hot water and mix the liquid with it. Melt the resin cerate and vaseline together, and add the liquid to the melted mass. Incorporate thoroughly and let cool.

Hair Tonic.

(J. A. C.)

(1)	Powdered borax	¼ ounce
	Tincture cantharides	½ ounce
	Aromatic spirits ammonia	½ ounce
	Glycerine	2 ounces
	Bay rum	2 ounces
	Sage tea, to make	1 pint
	Extract Japanese lilac	1 dram

Take 1 ounce of sage and steep 1 hour in a pint of soft water; filter, dissolve the borax in the tea, then add the other ingredients.

Jaborandi Tonic Hair Wash.

(2)	Glycerine	2 ounces
	Jaborandi leaves	4 drams
	Cinchona bark	1 ounce
	Alcohol	2 ounces
	Bay rum	2 ounces
	Rose water	10 ounces

Coarsely powder the jaborandi and cinchona; percolate with the alcohol, bay rum, and rose water mixed; add the glycerine to the percolate.

Florentine Hair Tonic.

(3)	Alcohol	12 ounces
	Castor oil	2 ounces
	Tincture of cantharides	1 ounce
	Tincture of orris root	1 ounce
	Oil of cloves	20 minims
	Oil of lemon	20 minims
	Oil of bergamot	1 dram

Color, if desired, with a little tincture of alkanet root.

Apply a teaspoonful or two, and rub well into the roots of the hair.

Sealing Wax for Bottles.

(P. A. L.) Sealing wax for bottles belongs to the most ordinary sorts of sealing wax, and of course can only be colored with the cheapest kinds of coloring matter. Many manufacturers prepare sealing wax with a mixture of common pine resin, turpentine, chalk and the proper coloring matter only. The composition is applied by dipping the necks of the bottles into the melted mass, which, upon cooling, covers the cork with a layer of wax. To avoid brittleness, or "stickiness," shellac is generally added in about the proportion of 10 to 15 per cent. of the mass. Here are some formulas:

Black.

(1) Take 6 parts of resin; 3 parts paraffin, melt together. Add 28½ parts of lampblack. Another color can be produced by taking about 5 to 7 parts to 100 parts of the mass, of chrome yellow, ultramarine, etc.

Blue.

(2)	Shellac	7 parts
	Turpentine	6 parts
	Pine resin	3½ parts
	Magnesia	1 part
	Chalk	2 parts
	Blue coloring matter	2 to 2½ parts

Brown.

(3)	Shellac	4 parts
	Turpentine	12 parts
	Pine resin	8 parts
	Gypsum	4 parts
	Chalk	4 parts
	Umber	4 parts

The shellac for preparing chocolate brown sealing wax must not be too dark. The product of the above recipe is dark brown, and unbleached shellac and dark resin may be used for preparing it.

(4)	Gelatine	4 ounces
	Water	8 ounces
	Dry white lead	3 ounces
	Cochineal, q. s.	
	Glycerine	½ ounce

Mix.

Transparent Capping Fluid (Era Formulary.)

(5) Dip the heads of bottles, suitably corked; and, if desirable, provided with a tag or label pasted over the cork, into a fluid prepared with the following ingredients:

Colophonium (resin)	20.0 parts
Ether	40.0 parts
Collodion	60.0 parts

Coloring matter to suit.

The liquid (varnish) dries rapidly and leaves a beautiful transparent coating.

Manufacture of Acetone.

(W. P. T.) Acetone is largely used in the manufacture of smokeless powder and the preparation of celluloid goods; it is also used as a solvent for fats, resins, camphors, etc. Upon a large scale it is obtained by the destructive distillation of calcium acetate; the operation being affected in a flat cast iron still, provided with stirrers which almost touch the bottom of the vessel. The construction of the mixer is of importance, as unless it is capable of thoroughly stirring the mass during the whole operation, the yield of acetone is greatly diminished. The best results are obtained by maintaining a dull red heat (500°-600°), care being taken that the pipes, which convey the gaseous products to the tar separator and condenser, are of sufficient width to prevent stoppages. They should, moreover, be constructed so that they can be easily and rapidly removed and replaced. Having heated the still to the requisite temperature, the mixer is started and finely ground calcium acetate (as dry as possible) introduced through the manhole. The distillation is then proceeded with, which with a charge of 100 kilos, should occupy from two to three hours. The first distillate is water, originating from the moisture in the acetate. It is more or less colored, has an empyreumatic odor, and contains a few per cent. of acetone. After a time the flow of water slackens, followed by a stage when hardly anything comes over; and when the temperature has risen high enough, acetone oils distil over. The total distillate forms a dark brown, highly inflammable liquid, having an empyreumatic odor and being contaminated with tarry substances and calcium acetate which has been carried over mechanically. On standing, it separates into two layers. The top layer, comprising about one-tenth of the bulk, contains the so-called "heavy acetone oils," whilst the bottom layer is chiefly composed of acetone and the lighter acetone oils held in solution by water.

The crude acetone thus obtained is largely contaminated with acetone oils, which are mainly composed of higher ketones originating from homologues of acetic acid present in calcium acetate; they also contain aldehydes, due to the presence of formic acid, condensation products of acetone, acids, phenols, and tarry substances. To minimize the formation of these secondary products and obtain better yields, Bauschlicher proposes to effect the decomposition in the presence of lime. Although the latter retains the tarry constituents, it does not act on the higher ketones and condensation products; and as these comprise by far the largest proportion of the secondary products, the utility of the process has been questioned.

For the preparation of pure acetone (Journal Soc. Chem. Ind.), the crude product is diluted with water, treated with milk of lime, and allowed to stand for some time. The supernatant oily layer is then mixed with water and subjected to distillation in a column still. With a well constructed apparatus the first rectification gives, as main fraction, a very pure product showing 99° to 99.5° Tr., and failing to give a turbidity with water. It contains only traces of aldehyde and empyreuma, and these are entirely removed by another distillation. The following are the commercial tests for English acetone: (1.) The specific gravity should not exceed 0.802 at 15°, and the acetone should volatilize completely, without leaving a residue, when heated to 100°. (2.) When subjected to distillation, four-fifths of the original quantity taken should distil over at 58.8°, and, besides acetone, the residue should contain no substances other than those originating from the manufacture of acetone. (3.) 100 cc. of acetone mixed with 1 cc. of potassium permanganate solution (0.1 per cent.) should show no change of color within two minutes. (4.) The acetone should not contain more than 0.005 per cent. of acid calculated as acetic acid. For testing this, 50 c. c. of acetone are diluted with 50 c. c. of water, 2 c. c. of a solution of phenolphthalein (1:1,000 alcohol of 50 per cent.) are then added, after which the mixture is titrated with sodium hydroxide solution (1 c. c. = 0.0006 gram of CH_3COOH).

The first and last runnings and the oils recovered during the clarification process with milk of lime are mixed together and redistilled, when a further quantity of suitable acetone is obtained. The residual oils constitute the so-called acetone oils, introduced into commerce as light oils (boiling between 75° and 130°) and heavy oils (boiling between 130° and 250°).

INSECT WAX IN AMERICA.—In a paper read to the American Association upon the scale insects which secrete wax, Dr. L. O. Howard showed that although industries of considerable importance have been derived from the secretions of such insects in Oriental regions, nothing of the kind has so far been done in America. Yet several species exist in the Southwestern States which might possibly be of commercial value. Thus a bark louse is found upon three species of oak in Southern California, in practically unlimited supply. A partial chemical investigation has shown that while a very excellent wax may be dissolved by means of chloroform from the insect mass, an insoluble residue remains which has a general resemblance in physical properties to India rubber.—(Pop. Sci. Monthly.)

THE PHARMACEUTICAL ERA

[*WEEKLY.*]

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"The British and Coloaial Druggist," London.

Subscriptions and advertisements for this weekly drug journal will be received and forwarded through this office. Specimen copies and schedule of rates will be furnished upon application.

A SUGGESTION FOR A CHRISTMAS PRESENT.

In drug stores where exists that esteem between employer and employé which finds expression in gift-giving at Christmas time, there is already some thought being given to the question of what to give. Along with the quality of pleasing, there is a strong desire to combine utility and practical usefulness. If the thought along this line should turn to books, there is assuredly a valuable suggestion in mention of the Era Formulary. It is not a text book, for study, and as a gift it does not convey the suggestion that the recipient should better qualify himself for his work, but it is what is far better, a work which makes practical application of the teachings of text books. Through its 5,000 formulas it guides the pharmacist to profitable application of what he already knows. It gives him directions for making hundreds of articles which customers of drug stores want, and is the foundation for that manufacturing department which should be a part of every pharmacy. Where profitable utility is so prominent in a gift, there is no question about its pleasing. The Era Formulary should be at the top of the list of things to be considered as a gift to pharmaceutical friends. Price, $5.00 per copy, delivered.

Thanksgiving, 1897.

There is perhaps merited reproach in the frequent observation that custom has so staled the significance of Thanksgiving that the average person regards it as a day upon which he does not work, but simply eats more than usual. This degradation of tradition is not an affair in which the druggist is a participant. He usually works. Circumstances compel him to keep more or less open shop for the benefit of his fellow man. Business may not be brisk, but he is expected to be around the premises somewhere to relieve those sufferings which attend festivity. This may have some appearance of an aggravated hardness of lot, but in fact it has its advantages. While the rest of the world has thoughtlessly laid the foundation for the headache and indigestion of the morrow, the druggist has calmly contemplated the true significance of Thanksgiving. There is time for thought of the big wheat crop which is bankrupting the foreigners who are compelled to pay our price for it. Our political mediums have at last materialized the spirit of Prosperity so that even the doubters admit its shadowy outline. "Business is good," is a phrase of such frequent repetition that its echo has become almost permanent and unbroken. The thought of these arise as the druggist snatches a few moments to do his duty to roast turkey and its inevitable sauce, and between rifts in the clouds of smoke from the after-dinner cigar there is a picture of the thankful pharmacist industriously compounding the headache and dyspepsia remedy for that demand which he is sure will manifest itself.

The Physician's Supply Evil.

A Kansas correspondent sends us a circular letter, gotten out by an Omaha concern, and handed to him by a doctor, its recipient. This letter, wonderful in its grammatical construction, reads thus:

"Omaha, Neb., Nov. 1, 1897.

"Dear Doctor: We send you herewith a copy of our Drug and Pharmaceutical list for 1897-1898, which we hope will be used in making up your orders for such supplies as may be required for your practice.

"We do a large business with physicians in this Western country, who prepare medicines for the use of their patients, as it is an acknowledged fact that patients are much more satisfied if their physicians supply the remedies needed, and the small cost of medicines is such that the physicians find it to their financial benefit. The extremely small cost of reliable compressed tablets, and other pharmaceutical preparations do not call for a great outlay of money for the carrying of a stock of such supplies.

"Also in these days where new remedies are being brought to the notice of the profession, very few drug stores keep up to the advance in modern medicines, and it has been proven many times that many druggists upon receiving a prescription and not having the medicine called for, put in what they have on hand, the physician being none the wiser, except that his patient does not make the progress that is expected. Also many druggists make a business of counter-prescribing, and refill the same prescription many times over, all of which is a detriment to the medical profession and to the patient.

"We should be pleased to supply you at wholesale prices with Drugs and Supplies, and will try to please you and make everything satisfactory. Yours truly,

"THE ———————— CO."

Our friend writes, in ejaculatory phrases, "Look at the narrow-mindedness of this manager. Has he any brains at all? I think you can find enough from top to bottom of his circular to make him feel small." Our correspondent is excusable for developing a little warmth under the collar, but he need not hope that anything or anyone can make these concerns feel small. They are not built that way. Our advice to druggists is to fight the devil with fire. You have the remedy in your own hands. Display as much activity and enterprise in cultivating the physician's favor as do the supply concerns, and they will not get a hearing and a foothold. Supply the doctors yourself and at best terms. You can do it as well as these cormorant concerns. Don't let them cut away the ground from beneath your feet. All things being equal, the doctor will choose the druggist every time.

The Trading Stamp.

The trading stamp scheme is familiar to every one. A full description was printed on page 604 of the October 21st issue of this journal. The merchant gives a stamp with every ten-cent sale and the collector of fifty or a hundred dollars' worth of these stamps, which, presumably, have cost him nothing, has a bewildering array of valuable premiums to choose from to his taste and to pay for with the stamps. The scheme has invaded all the large cities. The thrifty, shopping housewife likes it, and sees visions of pianos, cuckoo clocks, jewelry, even bicycles, as rewards for her activity in gathering stamps. Some merchants like it also, believing it brings a profitable increase of trade, but others are very bitter against it. It has invaded the retail drug trade, and, as in other lines of business, it is causing lots of trouble and hard feeling. This is well shown by relating the experience of some druggists in Michigan.

In Port Huron two druggists only made contracts with the trading stamp company, and an unmistakable increase in the business of the two stores was noticed from the very moment the big sign "We give trading stamps" appeared in the windows. A meeting of the druggists was held, at which it was claimed that the two agents of the company were infringing upon the private arrangement existing among the druggists to maintain prices. It was construed that the trading stamp druggists were nothing more nor less than cutters, to the extent of the worth of the stamp. To meet this, one druggist went so far as to order 10,000 stamps of a lithographic company, to go into the trading stamp business on his own account. It is alleged that his stamps were fac-similes of the stamps of the big company. Things got so lively that a second meeting was called, and after a heated controversy, it was decided that peace could be restored only by throwing out the stamps altogether. A regular love-feast followed, and peace reigns again. How the druggists who contracted for the stamps will get out of their contract without loss is not known.

In Saginaw, too, the trading stamp agitation is very strong. Two months ago the cut-rate war was declared over, and prices were restored. There, as in Port Huron, the giving of the stamps is looked upon as a form of cutting and as a violation of the compact entered into only two months ago. Of two druggists who contracted to use the stamps, one said he did so because he thought it was a good thing, and that he intended to keep it up. The other said he felt doubtful about the benefit, but did it in self-protection; so doubtful was he that instead of contracting for a year, as is usual, he had a clause inserted that at any time he could discontinue the use of the stamps by giving a 30-days' notice. Besides, he gives no prominence to the fact that he is an agent for the company. However, he has not yet given his 30-days' notice, and says he will await developments. The merchants of Saginaw generally are opposed to the scheme of the stamps. It seems that the stamp-giving houses have advertised the fact more or less in the daily papers. This seems to be a little more than the rest of them can stand, and there is a movement on foot to stop it. It is proposed that the merchants who are so opposed to the scheme shall declare as a body that all their "ads" will be withdrawn from those papers advertising the "We give trading stamps" merchants.

The experiences of druggists in these cities may be taken as fairly representing the state of affairs generally. The trading stamp is not so popular as it once was. Gift schemes are all right in their proper place, but we do not believe that place is the drug business.

Not So Bad.

We have received a letter from D. S. Clark, of South Omaha, Neb., which says a few words and says them so well that we are quick to publish them without much comment, and with no controversial contradiction, as he expresses exactly our own sentiments and convictions. Hear him, heed his words, and let us try to find the good and not mention the bad in the drug business:

> "After reading recent issues of some of our drug journals I feel like asking them and so many of their contributors if it would not be well, and if the facts and condition of the trade do not really demand, to change from their constant policy of distress and nature of contributions to the pleasant and profitable side of our business or profession, as you choose to call it. From these sources we have heard little but gloomy reports during the past ten years, and I often wonder if other drug journal readers who conduct successful and profitable businesses, even where prices are cut and competition active, ever grow disgusted with the continual lament over the deplorable condition of the retail drug trade and inevitable ruin to which we are being driven.
>
> "It no doubt is true that the drug business cannot be successfully conducted on such liberal, even reckless, methods as some years ago, but even to-day I am firm in the belief that every druggist who is bright and up-to-date, attending closely to every detail of a strictly drug business, is making a better living than his business neighbors, and has a nice balance each year. To warn the trade of impending danger and offer remedies is well, but it certainly is bad policy and lends a very bad influence to continue constantly complaining for us and predicting calamity. Its teaching is nothing but bad, induces indifference and finally, it would seem, disaster. Imagine the depressing influence on the ambition of the energetic and hopeful clerk who looks to the future for a business of his own, and, too, on the weaker members who are easily discouraged.
>
> "Let our journals, who have and claim a friendly interest in our welfare, continue to give us the good business hints to meet the constantly changing conditions and inaugurate educational methods of training, such as the Pharmaceutical Era's Course in Pharmacy. Discourage contributions from the unsuccessful and discontented, and make every page bear distinct features of good cheer, and encouragement to the worthy, industrious druggist and his help."

Commendatory and a Free Ad.

The city of Evansville, Ind., has been pestered with a cut-rate drug store. One of the local papers, the Weekly Economist, does not believe in cutting in any line of business and does not hesitate to say so pretty emphatically. It has published a number of straightforward, red-hot editorials directed against the particular drug store in question. By so doing it has gained the approval of the Evansville Pharmaceutical Association, which a few days ago passed formal resolutions of thanks to the editor "for the unselfish interest he has voluntarily taken in upholding the standard of respectability and legitimacy of the drug business in this city and for the many able editorials he has voluntarily, without remuneration, published in his paper that have a tendency to educate the masses against the prostitution and demoralization of the drug business by dealers who resort to unprincipled methods." Naturally the paper finds this good material for publication and broadcast circular distribution, but that's all right. It is a good thing for local dealers to have the support of the local papers, and for both to combine against outside and unbusiness-like concerns and methods which only bring demoralization and discord. So we are glad to give the Economist this little additional free advertising and say it is a good paper, in this one respect, any way.

Read and Don't Be Swindled.

If medicine proprietors, and especially their credit clerks, read the drug journals, especially this one, there would be fewer suckers for Crosher, Gerrish, Frazer, McIntyre, et al. to hook. But they not only don't read, but they show a most unaccountable and surprising lack of common business sense in honoring the orders of these frauds and swindlers. The Philadelphia concern whose operations were exposed in this paper last week secured victims to the tune of $800, $500, $250, etc., to say nothing of a lot of smaller amounts, and these victims were among the best-known and largest proprietary medicine concerns in the country, who ought to know better than to send goods to strangers, without rating and reference, and without cash in advance. In view of this absolute stupidity we cannot feel real sorry for the sufferers. But what's the use talking? They don't read and will not see this paragraph.

HOW IS THIS?

Portland, Ind., Nov. 15, 1897.

To the Editor: I notice in my last Era the statement Strong, Cobb & Co. make in reference to the custom Cleveland jobbers have of free box and cartage.

I wish to inform them through the Era that I have always paid them boxing and cartage. Yours respectfully.

JULIUS C. MARSH.

(Concluded from page 756, Nov. 18.)

THE CENTURY'S PROGRESS IN CHEMISTRY.*

BY HENRY SMITH WILLIAMS, M. D.

VI.

These utterly novel studies of molecular architecture may seem at first sight to take from the atom much of its former prestige as the all-important personage of the chemical world. Since so much depends upon the mere position of the atoms, it may appear that comparatively little depends upon the nature of the atoms themselves. But such a view is incorrect, for on closer consideration it will appear that at no time has the atom been seen to renounce its peculiar personality. Within certain limits the character of a molecule may be altered by changing the positions of its atoms (just as different buildings may be constructed of the same bricks), but these limits are sharply defined, and it would be as impossible to exceed them as it would be to build a stone building with bricks. From first to last the brick remains a brick, whatever the style of architecture it helps to construct; it never becomes a stone. And just as closely does each atom retain its own peculiar properties, regardless of its surroundings.

Thus, for example, the carbon atom may take part in the formation at one time of a diamond, again of a piece of coal, and yet again of a particle of sugar, of wood fiber, of animal tissue, or of a gas in the atmosphere: but from first to last—from glass-cutting gem to intangible gas—there is no demonstrable change whatever in any single property of the atom itself. So far as we know, its size, its weight, its capacity for vibration or rotation, and its inherent affinities, remain absolutely unchanged throughout all these varying fortunes of position and association. And the same thing is true of every atom of all of the sixty-odd elementary substances with which the modern chemist is acquainted. Every one appears always to maintain its unique integrity, gaining nothing and losing nothing.

All this being true, it would seem as if the position of the Daltonian atom as a primordial bit of matter, indestructible and non-transmutable, had been put to the test by the chemistry of our century, and not found wanting. Since those early days of the century when the electric battery performed all its miracles and seemingly reached its limitations in the hands of Davy, many new elementary substances have been discovered, but no single element has been displaced from its position as an undecomposable body. Rather have the analyses of the chemist seemed to make it more and more certain that all elementary atoms are in truth what John Herschel called them, "manufactured articles"—primordial, changeless, indestructible.

And yet, oddly enough, it has chanced that hand in hand with the experiments leading to such a goal have gone other experiments and speculations of exactly the opposite tenor. In each generation there have been chemists among the leaders of their science who have refused to admit that the so-called elements are really elements at all in any final sense, and who have sought eagerly for proof which might warrant their scepticism. The first bit of evidence tending to support this view was furnished by an English physician, Dr. William Prout, who in 1815 called attention to a curious relation to be observed between the atomic weights of the various elements. Accepting the figures given by the authorities of the time (notably Thomson and Berzelius), it appeared that a strikingly large proportion of the atomic weights were exact multiples of the weight of hydrogen, and that others differed so slightly that errors of observation might explain the discrepancy. Prout felt that this could not be accidental, and he could think of no tenable explanation, unless it be that the atoms of the various alleged elements are made up of different fixed numbers of hydrogen atoms. Could it be that the one true element—the one primal matter—is hydrogen, and that all other forms of matter are but compounds of this original substance?

Prout advanced this startling idea at first tentatively, in an anonymous publication; but afterward he espoused it openly and urged its tenability. Coming just after Davy's dissociation of some supposed elements, the idea proved alluring, and for a time gained such popularity that chemists were disposed to round out the observed atomic weights of all elements into whole numbers. But presently renewed determinations of the atomic weights seemed to discountenance this practice, and Prout's alleged law fell into disrepute. It was revived, however, about 1840, by Dumas, whose great authority secured it a respectful hearing, and whose careful redetermination of the weight of carbon, making it exactly twelve times that of hydrogen, aided the cause.

Subsequently Stas, the pupil of Dumas, undertook a long series of determinations of atomic weights, with the expectation of confirming the Proutian hypothesis. But his results seemed to disprove the hypothesis, for the atomic weights of many elements differed from whole numbers by more, it was thought, than the limits of error of the experiments. It is noteworthy, however, that the confidence of Dumas was not shaken, though he was led to modify the hypothesis, and, in accordance with previous suggestions of Clark and of Marignac, to recognize as the primordial element, not hydrogen itself, but an atom half the weight, or even one-fourth the weight of that of hydrogen, of which primordial atom the hydrogen atom itself is compounded. But even in this modified form the hypothesis found great opposition from experimental observers.

In 1864, however, a novel relation between the weights of the elements and their other characteristics was called to the attention of chemists by Professor A. R. Newlands of London, who had noticed that if the elements are arranged serially in the numerical order of their atomic weights, there is a curious recurrence of similar properties at intervals of eight elements. This so-called "law of octaves" attracted little immediate attention, but the facts it connotes soon came under the observation of other chemists, notably of Professors Gustav Hinrichs, in America; Dmitri Mendeléeff in Russia, and Lothar Meyer in Germany. Mendeléeff gave the discovery fullest expression, expositing it in 1869, under the title of "periodic law."

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*Reprinted from Harper's Monthly Magazine, October, 1897. Copyrighted by Harper Bros.

Though this early exposition of what has since been admitted to be a most important discovery was very fully outlined, the generality of chemists gave it little heed till a decade or so later, when three new elements, gallium, scandium, and germanium, were discovered, which, on being analyzed, where quite unexpectedly found to fit into three gaps which Mendelèeff had left in his periodic scale. In effect, the periodic law had enabled Mendelèeff to predicate the existence of the new elements years before they were discovered. Surely a system that leads to such results is no mere vagary. So very soon the periodic law took its place as one of the most important generalizations of chemical science. This law of periodicity was put forward as an expression of observed relations independent of hypothesis; but of course the theoretical bearings of these facts could not be overlooked. As Professor J. H. Gladstone has said, it forces upon us "the conviction that the elements are not separate bodies created without reference to one another, but that they have been originally fashioned, or have been built up from one another, according to some general plan." It is but a short step from that proposition to the Proutian hypothesis.

But the atomic weights are not alone in suggesting the compound nature of the alleged elements. Evidence of a totally different kind has contributed to the same end, from a source that could hardly have been imagined when the Proutian hypothesis was formulated, through the addition of a novel weapon to the armamentarium of the chemist—the spectroscope. The perfection of this instrument, in the hands of two German scientists, Gustav Robert Kirchhoff and Robert Wilhelm Bunsen, came about through the investigation, toward the middle of the century, of the meaning of the dark lines which had been observed in the solar spectrum by Fraunhofer as early as 1815, and by Wollaston, a decade earlier. It was suspected by Stokes and by Fox Talbot in England, but first brought to demonstration by Kirchhoff and Bunsen, that these lines, which were known to occupy definite positions in the spectrum, are really indicative of particular elementary substances. By means of the spectroscope, which is essentially a magnifying lens attached to a prism of glass, it is possible to locate the lines with great accuracy, and it was soon shown that here was a new means of chemical analysis of the most exquisite delicacy. It was found, for example, that the spectroscope could detect the presence of a quantity of sodium so infinitesimal as the one two-hundred-thousandth of a grain. But what was even more important, the spectroscope put no limit upon the distance of location of the substance it tested, provided only that sufficient light came from it. The experiments it recorded might be performed in the sun, or in the most distant stars or nebulæ; indeed, one of the earliest feats of the instrument was to wrench from the sun the secret of his chemical constitution.

To render the utility of the spectroscope complete, however, it was necessary to link with it another new chemical agency, namely, photography. This now familiar process is based on the property of light to decompose certain unstable compounds of silver, and thus alter their chemical composition. We have seen that Davy and Wedgwood barely escaped the discovery of the value of the photographic method. Their successors quite overlooked it until about 1826, when Louis J. M. Daguerre, the French chemist, took the matter in hand, and after many years of experimentation brought it to relative perfection in 1839, in which year the famous daguerreotype first brought the matter to popular attention. In the same year Mr. Fox Talbot read a paper on the subject before the Royal Society, and soon afterward the efforts of Herschel and numerous other natural philosophers contributed to the advancement of the new method.

In 1843 Dr. John W. Draper, the famous English-American chemist and physiologist, showed that by photography the Fraunhofer lines in the solar spectrum might be mapped with absolute accuracy, also proving that the silvered film revealed many lines invisible to the unaided eye. The value of this method of observation was recognized at once, and as soon as the spectroscope was perfected, the photographic method, in conjunction with its use, became invaluable to the chemist. By this means comparisons of spectra may be made with a degree of accuracy not otherwise obtainable, and in case of the stars, whole clusters of spectra may be placed on record at a single observation.

As the examination of the sun and stars proceeded, chemists were amazed or delighted, according to their various preconceptions, to witness the proof that many familiar terrestrial elements are to be found in the celestial bodies. But what perhaps surprised them most was to observe the enormous preponderance in the sidereal bodies of the element hydrogen. Not only are there vast quantities of this element in the sun's atmosphere, but some other suns appeared to show hydrogen lines exclusively in their spectra. Presently it appeared that the stars of which this is true are those white stars, such as Sirius, which had been conjectured to be the hottest; whereas stars that are only red-hot, like our sun, show also the vapors of many other elements, including iron and other metals. ,

In 1878 Mr. J. Norman Lockyer, in a paper before the Royal Society, called attention to the possible significance of this series of observations. He urged that the fact of the sun showing fewer elements than are observed here on the cool earth, while stars much hotter than the sun show chiefly one element, and that one hydrogen, the lightest of known elements, seemed to give color to the possibility that our alleged elements are really compounds, which at the temperature of the hottest stars may be decomposed into hydrogen, the latter "element" itself being also doubtless a compound, which might be resolved under yet more trying conditions.

Here, then, was what might be termed direct experimental evidence for the hypothesis of Prout. Unfortunately, however, it is evidence of a kind which only a few experts are competent to discuss—so very delicate a matter is the spectral analysis of the stars. What is still more unfortunate, the experts do not agree among themselves as to the validity of Mr. Lockyer's conclusions. Some, like Professor Crookes, have accepted them with acclaim, hailing Lockyer as "the Darwin of the inorganic world," while others have sought a different explanation of the facts he brings forward. As yet it cannot be said that the controversy has been brought to final settlement. Still, it is hardly to be doubted that now, since the periodic law has seemed to join hands with the spectroscope, a belief in the compound nature of the so-called elements is rapidly gaining ground. More and more general becomes the belief that the Daltonian atom is really a compound radical, and that back of the seeming diversity of the alleged elements is a single unique form of primordial matter. But it should not be forgotten that this view, whatever its attractiveness, still lurks in the domain of theory. There is no proof that the Daltonian atom has yet been divided in the laboratory.

A little learning is a dangerous thing, and when a druggist attempts to practice medicine without knowing enough to do so intelligently and safely, the results are very apt to be disastrous. A druggist in Sioux City, Ia., the other day administered a hypodermic injection of morphine to his brother and thereby killed him. One has the right to experiment on one's self ad libitum, but it is a serious matter to tamper with another's health and life.

The Era Course in Pharmacy

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LECTURE NO. 25.

Inorganic Chemistry.

The Oxygen Group—(Concluded).—Nitrogen Group.

SELENIUM.

Symbol Se. Valence 2, 4, 6. Atomic Weight 78.87.

Historical.—Selenium was discovered by the Swedish chemist Berzelius in 1817, in the red deposit found in sulfuric acid chambers when that acid is prepared from iron pyrites. The name was taken from the Greek *selena*, the moon.

Natural Source.—It is found in small quantities in some varieties of iron and copper pyrites, and also occurs as the selenids of silver, copper, lead, and mercury.

Preparation.—The selenium of the markets is usually obtained from the red deposit of sulfuric acid chambers above referred to, by a process intended to remove the lead and other substances present. It is never prepared by the student.

Description and Physical Properties.—It is usually in the form of a brick red powder, or in dark red translucent crystals. Like sulfur, several allotropic forms are known, differing in color, solubility in carbon disulfid, and crystalline form.

The several modifications have a specific gravity varying from 4.3 to 4.8. The form of selenium soluble in carbon disulfid has no definite melting point. The insoluble variety melts at 117° C. It boils at about 700° and yields dark red vapors. The same anomalies of vapor density are noticed as in the case of sulfur.

The most remarkable property of selenium is that exposure to light increases its conducting power for electricity.

Chemical Properties.—Heated in the air selenium burns with a bright blue flame, yielding selenium oxid, SeO_2, and an odor like that of rotten horse radish.

COMPOUNDS OF SELENIUM.

Hydrogen Selenid, H_2Se.—This compound may be prepared by heating together hydrogen and selenium vapor, or by the action of dilute hydrochloric acid on ferrous selenid, FeSe. It is a colorless, inflammable gas, with an odor resembling, but more offensive than that of hydrogen sulfid. It is especially irritating to the mucous membrane of the mouth, eyes, and nose. It precipitates many of the heavy metals as selenids.

Halogen Compounds.—With chlorin, bromin and fluorin selenium forms compounds similar to the corresponding compounds of these elements with sulfur.

Selenium and Oxygen.—One oxid of selenium, the dioxid, SeO_2, and two oxygen acids, Selenous, H_2SeO_3, and Selenic, H_2SeO_4, are known.

At ordinary temperatures the dioxid occurs in white, shining, needle-shaped crystals. At about 300° the crystals are converted to a greenish yellow vapor. Selenous acid forms colorless, transparent, prismatic crystals.

Selenic acid in the most concentrated form is a colorless liquid, containing 97.4 per cent. of the absolute acid, and having a specific gravity of 2.627. The concentrated acid is said to have the property of dissolving gold. The selenates bear a very close resemblance to the corresponding sulfates.

Characteristic Reactions.—The compounds of this element are identified by the red precipitate of selenium which they yield when treated with sulfurous acid.

TELLURIUM.

Symbol Te. Valence 2, 4, 6. Atomic Weight 125.

Historical.—Tellurium had been known in its ores for a considerable time, but the final demonstration of its elemental nature was made by Klaproth in 1798. Its name is derived from *tellus*, the earth.

Natural Sources.—Tellurium exists in nature as the tellurides of lead, silver and gold, and also in the elemental state.

Description and Physical Properties.—Tellurium is a bluish-white solid, of a metallic luster, and has a specific gravity of 6.24.

It melts at about 500°, and can be distilled in the presence of hydrogen, but when heated in the air burns with a blue flame, yielding white vapors of tellurium dioxid.

Chemical Properties.—In its general properties, tellurium closely resembles sulfur and selenium, except that its basic properties are somewhat more strongly marked, and its acid compounds correspondingly more instable. Unlike sulfur and selenium, tellurium is not soluble in carbon disulfid.

COMPOUNDS OF TELLURIUM.

Hydrogen tellurid, H_2Te.—A colorless gas of a disagreeable odor, resembling that of hydrogen sulfid. It is prepared by the solution of zinc tellurid in hydrochloric acid.

$$ZnTe + 2HCl = ZnCl_2 + H_2Te.$$

In most of its properties it resembles hydrogen sulfid, forming precipitates of tellurids with many of the heavy metals.

Halogen Compound.—With chlorin, bromin, iodin, and fluorin it forms compounds similar to the corresponding compounds of these elements with selenium and sulfur.

Oxids and Oxygen Acids.—Tellurium forms two oxids, the dioxid, TeO_2, and the trioxid, TeO_3. There are two corresponding acids, Tellurous, H_2TeO_3 and Telluric, H_2TeO_4.

Tellurium dioxid is in the form of translucent octahedra, and tellurous acid in a white powder. Both are nearly insoluble in water.

The trioxid is an orange yellow crystalline mass. Telluric acid forms colorless crystals. It is only sparingly soluble in cold water. Many of the tellurates are likewise insoluble.

GENERAL CHARACTER OF THE OXYGEN GROUP.

Of the four elements just studied, oxygen exhibits the group characteristics in the smallest degree. The many analogies of its compounds to those of sulfur, however, justify its inclusion in the group.

All form binary compounds with hydrogen, though the oxygen compound, H_2O, differs widely in its properties, both chemical and physical, from those of the corresponding compounds of the other elements.

The three elements Sulfur, Selenium, and Tellurium exhibit many characters in common. The similarity of their gaseous hydrogen compounds in molecular structure, method of manufacture, and characteristic properties, such as odor, and precipitation of the heavy metals, is especially well marked. Like points of resemblance can be traced between the dioxids and trioxids, and their corresponding acids and salts.

As in the Chlorin group, there is not only a resemblance between the several elements of the group, but a more or less progressive change in properties. This is seen in the increase of specific gravity of the free elements, and a similar increase in the density of their oxids and oxygen acids, as the atomic weight rises from oxygen to tellurium.

A corresponding progression is seen in the change from the decided non-metallic properties of oxygen to the marked metallic qualities of tellurium, and in the decreasing stability of the hydrogen compounds, from the comparatively stable hydrogen sulfid to the very instable hydrogen tellurid.

There is also a noticeable decrease in solubility in carbon disulfid, from sulfur, which is freely soluble in that liquid, to tellurium which is insoluble. The salts of the most highly oxidized acids, as the sulfates, selenates, and tellurates, also exhibit a similar change of properties as regards their solubilities in water.

NITROGEN GROUP.

NITROGEN. PHOSPHORUS. ARSENIC. ANTIMONY. BISMUTH.

The elements of this family are all of very great importance, either in the free state or in the form of their compounds.

As the members of the oxygen group presented an advance in metallic properties over the chlorin group, so the nitrogen group in turn presents a still farther advance in the same direction. This fact is most evident by comparing the first and last members of each group.

Fluorin is distinguished by most intense chemical activity and non-metallic properties. Oxygen is also a very active element, but less energetic than Fluorin, while Nitrogen is noted for its inactivity in the free state. Iodin, the last member of the first group, presents a very slight advance toward metallicity. Tellurium, the last member of the second group, exhibits some decided metallic qualities, while Bismuth is an undoubted metal.

NITROGEN.

Symbol N. Valence 1, 3, 5. Atomic Weight 14.01.

Historical.—Nitrogen was first distinctly pointed out by Scheele, though its presence in air had previously been observed by Rutherford (1772) and other experimenters, who, however, failed to perceive its elementary character. Lavoisier recognized it as an elementary substance, and gave it the name *azote*, from its inability to sustain life, by which name it is still known to French chemists. The present name was suggested by Chaptal, from *nitron*, the Greek name for saltpetre, and *gennao*, I generate, in allusion to the fact that it is a constituent of that substance.

Natural Sources.—Nitrogen constitutes about four-fifths by volume of the earth's atmosphere. It is also found in combination in a large number of animal and vegetable substances, and in many inorganic compounds, such as the nitrates and ammonia salts.

Preparation.—The simplest method of obtaining nitrogen is by removing the oxygen from air by the combustion of phosphorus in a closed vessel. The element obtained by this method is always contaminated by a small residue of oxygen, and by the other normal constituents of the atmosphere, but is sufficiently pure for the purposes of the student.

Nearly pure nitrogen can be obtained by passing air, first over potassium hydroxid to deprive it of carbon dioxid, then through sulfuric acid to remove moisture, and finally through a tube heated to redness and containing copper filings, with which the oxygen unites, and collecting the residual nitrogen in a receiver beyond. The gas prepared in this manner still contains Argon, another element of the atmosphere very similar to nitrogen.

Nitrogen can also be obtained by heating certain easily decomposable compounds of ammonia. A concentrated solution of ammonium nitrite when heated splits up into nitrogen and water.

$$NH_4NO_2 = N_2 + 2H_2O.$$

A mixture of potassium dichromate and ammonium chlorid when heated yields nitrogen, with reduction of the chromium to sesquioxid, thus:

$$K_2Cr_2O_7 + 2NH_4Cl = N_2 + Cr_2O_3 + 2KCl + 4H_2O.$$

Nitrogen can also be obtained by the action of chlorin on ammonia, though this reaction is a hazardous one on account of the liability to the formation of the dangerously explosive nitrogen chlorid.

Description and Physical Properties.—Nitrogen is an odo less, colorless and tasteless gas. Its density is 14.01 compared with hydrogen, and 0.9713 as compared wit air. It is very slightly soluble in water. Like other gas eous elements it can be condensed by cold and pressur to the state of a liquid.

Chemical Properties.—The most distinctive character of ni trogen is its inertness in the free state, though many o its compounds are very active substances. It is neithe combustible nor a supporter of combustion. It unites di rectly with only a few other elements and with thes only with difficulty. Indirectly it combines to form large number of important compounds.

COMPOUNDS OF NITROGEN.

Hydrogen Compounds.—Nitrogen forms three compound with hydrogen, Ammonia, NH_3, Hydrazin, N_2H_4, an Azoimid, N_3H.

Ammonia. NH_3.—Ammonia can be formed artificially b the direct union of nitrogen and hydrogen by causin electric sparks to pass through a mixture of the gase This process is of scientific interest only, and is neve employed in the practical production of the compound.

Ammonia is produced naturally in the putrefaction nitrogenous animal and vegetable substances. It also results from the dry or destructive distillation of organic matter containing nitrogen, the principal commercial source of the ammonia compounds being the ammoniacal liquor formed as a by-product in the destructive distillation of coal in the manufacture of illuminating gas.

For experimental purposes it is generally obtained by the action of one of the fixed alkalies or alkaline earths upon an ammonium compound, when the latter is decomposed and ammonia set free, for example,

$$NH_4Cl + KOH = NH_3 + KCl + H_2O.$$

It is a colorless gas of a very peculiar, pungent, alkaline odor and strong caustic taste. It has an alkaline reaction with litmus and other indicators, and unites readily with acids to form salts, which bear a strong resemblance to the salts of the alkali metals. Because of its volatility and strongly alkaline qualities it is sometimes called the *volatile alkali*, to distinguish it from the *fixed* or true alkalies.

By means of cold and pressure ammonia is quickly reduced to a liquid, boiling at —33.7°. Since a liquid cannot vaporize without absorbing large quantities of heat, liquefied ammonia may be utilized in the manufacture of artificial ice. The water to be frozen is surrounded by hollow vessels filled with the liquid ammonia, which is then caused to evaporate rapidly by means of pumps, and in so doing absorbs sufficient heat from the water to cause it to assume the solid state, or freeze.

When ammonia is brought into contact with an acid the two unite to form a salt, but without the elimination of hydrogen of the acid, as

$$NH_3 + HCl = NH_4Cl.$$

The existence of the group NH_4 is therefore assumed as the basis of these salts and the name *ammonium* given to it. This radical, however, cannot exist in the free state, and is known only as a component of the ammonium salts.

Ammonia gas, NH_3, is very soluble in water, no less than 1,100 volumes of the gas being absorbed by that liquid at 0° C. When the gas dissolves in water Ammonium hydroxid, NH_4OH, is assumed to be formed, thus,

$$NH_3 + H_2O = NH_4OH.$$

The actual existence of the compound NH_4OH is somewhat doubtful, but it is practically convenient to consider it as a constituent of the aqueous solution.

The U. S. P. contains three preparations of the gas, *Aqua Ammoniæ*, a 10 per cent. aqueous solution, *Aqua Ammoniæ Fortior*, a 28 per cent. aqueous solution, and *Spiritus Ammoniæ*, a ten per cent. alcoholic solution. It is also employed in several other official preparations.

Hydrazin, N_2H_4, is obtained in a manner similar to ammonia, and has similar properties, though it is less strongly alkaline.

Azoimid, or Hydronitric Acid, N_3H, is obtained by oxidizing a solution of hydrazin by means of nitrous acid. It is a colorless, irritating gas, soluble in water, and has strongly acid properties. It dissolves such metals as copper, aluminum and zinc, forming nitrids. It is extremely instable, and explodes with great violence with the slightest jar or shock.

Halogen Compounds.—With Chlorin, Bromin and Iodin, nitrogen forms compounds which explode with great violence with the slightest touch or jar. For this reason it is never safe to bring ammonia in contact with either of these elements in the free state, unless the alkali be greatly in excess. The iodid of nitrogen, NI_3, is the least dangerous of the three, but the others are far too dangerous to be experimented with.

Oxygen Compounds.—Five oxids of nitrogen are known. They are:

N_2O, Nitrogen Monoxid.
N_2O_2, Nitrogen Dioxid.
N_2O_3, Nitrogen Trioxid.
N_2O_4, Nitrogen Tetroxid.
N_2O_5, Nitrogen Pentoxid.

Nitrogen can be made to combine with oxygen by passing electric sparks through a mixture of the elements, but the oxids are usually prepared from nitric acid as the starting point.

Nitrogen Monoxid, or Nitrous Oxid, N_2O, can be made by the reduction of nitric oxid by iron filings, or by other reducing agents, but is usually prepared by heating ammonium nitrate, which decomposes into nitrous oxid and water.

$$NH_4NO_3 = N_2O + 2H_2O.$$

Nitrous Oxid is a colorless gas of a rather pleasant sweetish taste and smell. When inhaled it causes a kind of mental exhilaration or intoxication, frequently accompanied by an inclination to laughter, hence the name "laughing gas" applied to it. Under various names, and sometimes mixed with other substances it is much used in dentistry as an anesthetic. Its use may be attended by fatal results if too long continued, or if improperly administered.

It is slightly soluble in cold water, less so in warm. Owing to the ease with which it parts with its oxygen it supports combustion nearly as well as the latter gas. Nitrous oxid is the theoretical anhydrid of hyponitrous acid.

Nitrogen Dioxid, or Nitric Oxid, N_2O_2 (or NO) is formed when moderately strong nitric acid acts upon certain metals, as copper, mercury, zinc, etc. It is a colorless gas, but unites directly with oxygen when coming into the air, forming brown fumes of the tetroxid, so that the fumes arising from the action of nitric acid on a metal are always colored. No acid is known corresponding to this oxid.

Ntrogen Trioxdii, N_2O_3, is formed along with the tetroxid when nitric acid is acted upon by certain reducing agents, as starch, sugar, etc. The mixed oxids are easily condensed and form a greenish blue liquid, but the liquid trioxid itself is described as a deep blue. An interesting fact in connection with this oxid is that at temperatures some distance above or below zero it is stable, and at or near zero decomposes.

In ice cold water the trioxid dissolves to form nitrous acid, but the solution is very instable.

Nitrogen Tetroxid, or Peroxid, NO_2 (or N_2O_4) is the substance formed when nitric oxid comes in contact with the oxygen of the air. At ordinary temperatures it is a reddish brown liquid, boiling at 22° C. The liquid becomes lighter in color when cooled, and at —9° C. forms colorless crystals. The vapor has the curious property of becoming darker when heated and at 140° is almost black. These color changes are most likely due to alteration in the molecular composition. The liquid molecule probably has the composition N_2O_4, and the vapor the composition NO_2.

There is no acid corresponding to the peroxid, but when dissolved in water it splits up into nitric acid and nitric oxid.

Nitrogen Pentoxid. N_2O_5, may be obtained by distilling a mixture of phosphorous pentoxid and anhydrous nitric acid. At ordinary temperatures it is a white, crystalline solid, and dissolves in water with the evolution of heat and the formation of nitric acid. It is a powerful oxidizing agent, acting upon some easily oxidizable substances with such intensity as to ignite them.

PRACTICAL STUDIES.

1. Place a piece of phosphorus as big as a pea in a tin box lid and float it on water contained in a pan or other vessel. Ignite the phosphorus and invert over it a glass jar or wide-mouth bottle. (Fig. 29.) The phosphorous consumes the oxygen of the air, forming white fumes of phosphorus pentoxid, which gradually dissolve in the water, the latter meanwhile rising in the jar to take the place of the consumed oxygen. (Caution: Do not handle the phosphorus with the naked fingers.)

Cover the mouth of the jar while still under water with a piece of glass, invert and remove from the water. The jar, of course, still retains the water which

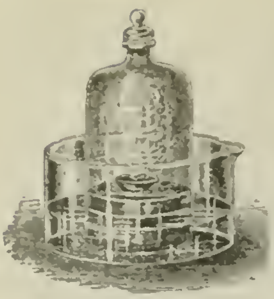

Fig 29. Removing Oxygen from air by Combustion of Phosphorus.

took the place of the oxygen. Test the combustibility of the gas by lowering into it a burning splinter. What occurs?

2. Examine about two grams of powdered ammonium chlorid. Has it any odor? Add to it an equal bulk of dry calcium oxid (Lime), mix and place in a dry test tube and heat over an alcohol lamp or gas burner. Has the mixture after heating any odor not possessed by either constitutent? Hold in the mouth of the tube a piece of red and a piece of blue litmus paper, first dry and then moistened. What occurs? Bring to the mouth of the test tube a glass rod or stopper wet with hydrochloric acid, and note the result.

Any ammonium salt may be used in place of the chlorid, and either potassium or sodium hydroxid, dry or in solution, in place of the lime.

Write equations showing the probable reaction of calcium oxid and ammonium chlorid, also showing the reaction between hydrochloric acid and ammonia gas.

3. Heat 5 Gm. ammonium nitrate, dry, in a test tube and test the evolved gas with a glowing coal, as in the experiment with oxygen. Commonly this experiment will be found more difficult of performance than the one with oxygen. Show by an equation the decomposition of the ammonium salt into nitrous oxid and water.

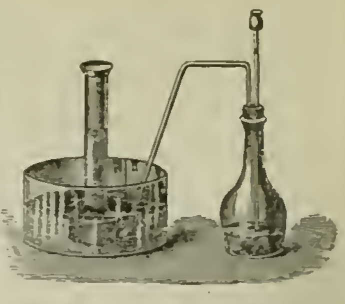

Fig. 30. Preparation of Nitric Oxid.

4. In a test tube, or small flask, fitted with a delivery tube, place 5 Gm. copper filings or foil and cover with nitric acid. (Fig. 30.) Fill another tube with water and invert in a pneumatic trough or dish containing some water. When the evolved gas begins to be colorless in the generator, bring the end of the delivery tube under the inverted tube and collect the gas by displacement. When the tube is filled with a colorless gas, invert it and note what takes place on contact with air. (Fig. 31.) What was the colorless gas? What was the colored gas? Write the equation which shows the production of the colored from the colorless gas.

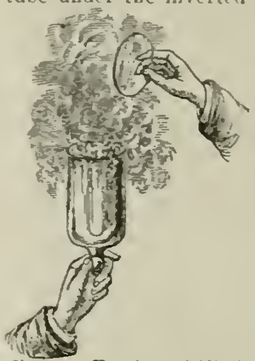

Fig. 31. Fuming of Nitric Oxid in Air.

5. Place 2 or 3 Gm. starch or sugar in a test tube, or flask, fitted with a delivery tube, add some strong nitric acid and heat. What is the probable composition of the brown red vapors produced?

LECTURE No. 26.

Pharmaceutical Physics.

Electrostatics.

Electrification.—A glass rod rubbed with silk, or a stick of sealing wax or an ebonite comb rubbed with a woolen cloth, acquires the power of attracting light objects, such as bits of paper, feathers, etc., which cling to it for an instant and are then repelled. This property of first attracting and then repelling light objects is known as *electrification*, and bodies which possess it are said to be electrified, or, more commonly, to be *charged with electricity*.

Positive and Negative Electrification.—A piece of paper which has been attracted and then repelled by electrified glass will be attracted by electrified sealing wax, and conversely, a piece which has been repelled by electrified sealing wax will now be attracted by electrified glass. Evidently therefore the electrification of the glass and sealing wax differ in character, since what is attracted by one is repelled by the other. For convenience the electrification of the glass is known as *vitreous*, or *positive*, and that of the wax as *resinous*, or *negative*, or as they are commonly designated, as + E and — E.

Law of Attraction and Repulsion.—If two electrified glass rods be suspended by threads near together they will be found to repel each other. A similar result will follow when two rods of electrified sealing wax are brought close to each other. If, however, one of the glass rods be suspended near to one of the sealing wax, the two will be attracted. Hence the law, that *bodies possessing the same kind of electricity repel, and bodies possessing different kinds attract each other.* The student will recall a similar law respecting the attraction and repulsion of magnets.

The Electroscope.—That bodies are in an electrified state may be shown by the attraction and repulsion of pieces of paper, pith, etc., as just described, but a more convenient method is by means of the *electroscope*. This in its simplest form is a glass jar through the cork of which passes a brass rod having a metal disk at its top, and at the bottom suspending two strips of gold leaf. (Fig. 80.)

When an electrified body is brought near to the disk the strips of gold leaf diverge, and remain divergent as long as the electrified body retains its position, coming together again when the latter is withdrawn.

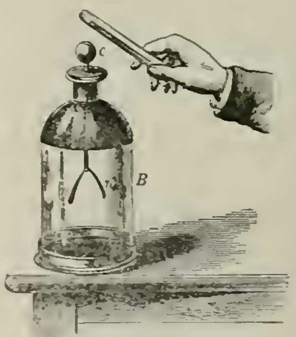

Fig. 80.—The Electroscope.

If the electrified body be allowed to *touch* the disk, the leaves will remain divergent after the excited body is removed. If now the disk be approached by a body possessing the same kind of electrification the leaves will diverge still farther, but if approached by a differently electrified body, will collapse.

The electroscope thus serves both to indicate the presence of electricity and to determine the kind.

Conductors and Insulators.—Conductors are bodies which readily conduct away or dissipate the electrifications of charged bodies. Metals are especially good conductors. Non-conductors, or insulators, are bodies which do not readily cause dissipation of an electrical charge. Such substances as glass, vulcanite, and rubber, are examples of good insulators.

These terms must be understood as having a relative meaning only, the difference between a conductor and a non-conductor being principally one of degree. Good conductors would be called poor insulators, and *vice versa*. An insulator is also known as a *dielectric*.

Electrification Confined to Outer Surface.—If a conductor, as a tin box or cup, be insulated by placing it upon glass or rubber, and a charge of electricity communicated to it, it will be found upon testing with an electroscope that the charge is all upon the outside of the vessel. So, also, if a spherical conductor be electrified and then covered by two hemispherical cups, provided with insulating handles, it will be found upon withdrawing the cups that they have taken up the charge of the sphere, leaving the latter unelectrified. (Fig. 81.) If a conductor be surrounded by a metallic screen of any kind, as wire gauze, it will be found impossible to electrify the conductor through the screen. It is thus seen that the electric charge of a conductor is confined to its outer surface, and that a body may be perfectly screened from external electrification by means of a metallic shell.

Electrical Induction.—If a body which is being attracted by another which is electrified, be tested by an electroscope it will also exhibit evidences of electrification, and is said to be electrified by *induction*, and the inducing body is known as the *inductor*. It will be found also that the electricity of the induced body will be opposite in sign to that of the inductor, i. e., if the inducing electricity be + E. the induced electricity next to it will be — E, while on the opposite end of the induced body the electricity will be + E, or the same as the electricity of the inductor. (Fig. 82.) The quantities of + E and — E produced by induction are exactly equal, and when the inducing body is withdrawn, neutralize each other.

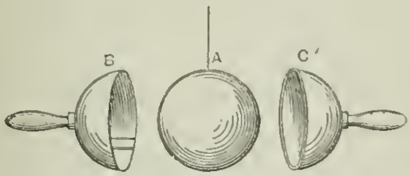

Fig. 81.—Electrified Sphere and Cups.

If, while these electricities are held separate by the inductor the body subject to induction be put in communication with the earth by touching it with the finger, the repelled electricity will flow through the operator to the earth, leaving the other electricity upon the induced body as a fixed charge which remains after the withdrawal of the inductor.

Induction Acts Through Dielectrics.—While an insulator or dielectric will not conduct electricity it will permit electric induction to take place through it. Thus in the examples just cited the induction took place through air, which is a good insulator, and might have occurred through sheets either of glass or vulcanite. The power, however, of transmitting induction is not the same for different dielectrics, but depends upon the *specific inductive capacity of each substance*.

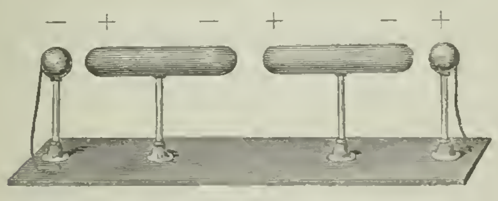

Fig. 82.—Electrification by Induction.

Distribution of Electricity.—If an insulated sphere which is charged with electricity be examined by means of an electroscope, the electricity will be found evenly distributed over the surface, as shown by the equal divergence of the leaves at every point. Hence the *electrical density* of a spherical conductor is uniform. If any other shaped conductor be tested, the ends, corners and edges will cause the greatest divergence when touched by the electroscope, showing that these portions possess the greatest amount of electricity, or that the *electrical density* is greatest upon the points and angular portions of a conductor.

If the face be brought near to a point projecting from a sufficiently charged conductor a breeze can be felt blowing against the cheek, or the point can be made to deflect the flame of a candle. This breeze is due to the fact that the air particles in contact with the conductor become charged with some of its electricity and are then repelled. As each particle carries away some of the electricity it follows that the charge of the conductor is by this means gradually dissipated. If such a point be viewed in the dark, it will be seen to be tipped with a luminous haze, known as a brush discharge. It is for this reason that the number of points and angles of a body intended to retain an electrical charge are always made as few as possible.

Electrical Discharge and Potential.—If an electrified body be touched with the finger, its electricity escapes through the body of the operator to the earth, and the body is said to be discharged.

Whether a discharge will or will not take place between two bodies depends upon their *difference of potential*. If the two bodies are of the same potential no discharge will take place; if they are of different potential the flow of electricity will pass from the body of higher to the body of lower potential. Potential is thus analogous in meaning to temperature. The latter term has no reference to the total quantity of heat contained by a body, but to its ability to receive heat from or impart it to other bodies. So potential is simply the electrical condition of a body which determines its ability to receive or give a charge of electricity.

For purposes of comparison the potential of the earth is taken as zero. A body charged with positive electricity is said to have a higher potential than the earth, and one charged with negative electricity to have a lower potential than the earth.

Electrostatics and Electrokinetics.—That portion of the science of electricity which considers the phenomena of electricity at rest, or as manifested by attractions and repulsions, is known as *electrostatics*. That branch of the subject which deals with electricity in motion is known as *electrokinetics*. Electricity at rest is called *static electricity*, and electricity in motion *current electricity*.

ELECTRICAL MACHINES.

The Friction Machine.—One of the oldest forms of apparatus for the continuous production of static electricity was the *friction machine*. This consisted of a circular plate of thick glass caused to turn by means of a crank against a cushion of leather or silk coated with an amalgam of zinc, tin and mercury. The cushion or rubber was placed in connection with a brass ball called the negative conductor, insulated by a glass pillar, and the plate with a similar insulated ball called the prime or positive conductor. When the plate revolved the friction caused the cushion and negative conductor to become negatively, and the circular plate and prime conductor positively electrified, so that a spark could be drawn from either. By "grounding" the negative conductor, that is, by connecting it with the floor, its negative electricity is conducted to the earth and neutralized, thus permitting the accumulation of a considerable charge of positive electricity upon the prime conductor.

Under favorable conditions the friction machine could be used for a variety of experiments, but was subject to atmospheric changes, and in damp weather could hardly be made to work at all. It has been entirely superseded by the more modern induction or influence machines, and is now only interesting as a part of the history of electrical science.

The Electrophorus.—This in its simplest form consists of a shallow metallic dish filled with sealing wax, and used in connection with a brass disk attached to a handle of glass or other insulating material. To use this apparatus, the sealing wax is struck or rubbed with cat's fur or a woolen cloth, and is thus charged with negative electricity. When the disk is laid upon the wax its under side is electrified positively and its upper side negatively, by induction from the electrified wax. (Fig. 83.) If now the disk be touched by the finger its negative electricity is conducted away to the earth, while its positive charge is held by the negative charge of the wax, and on lifting the disk by the handle a spark can be drawn from it by presenting the knuckle. (Fig. 84.) The disk can be repeatedly recharged and discharged in this manner without a fresh excitation of the wax.

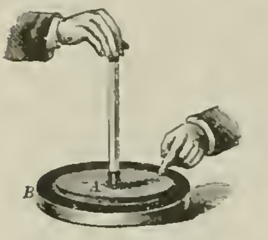

Fig. 83.—Charging Electrophorus.

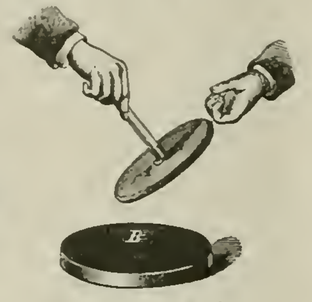

Fig. 84.—Discharging Electrophorus.

The Continuous Electrophorus—The most efficient electrical machines are those which work by induction and give a nearly continuous supply of electricity, as the Töpler-Holtz machine, so called from its inventors. (Fig. 85.)

In this instrument there is a large stationary glass plate, known as the *field plate*, on the back of which are pasted pieces of varnished cardboard to act as inductors. In front of the field plate is a smaller revolving plate bearing circular pieces of tin foil, called *carriers*, placed at equal intervals, each carrier having a metallic button at its center. From each inductor on the back of the fixed plate is a curved metallic arm which reaches over the revolving plate and holds a small tinsel brush which sweeps over each carrier as it passes by.

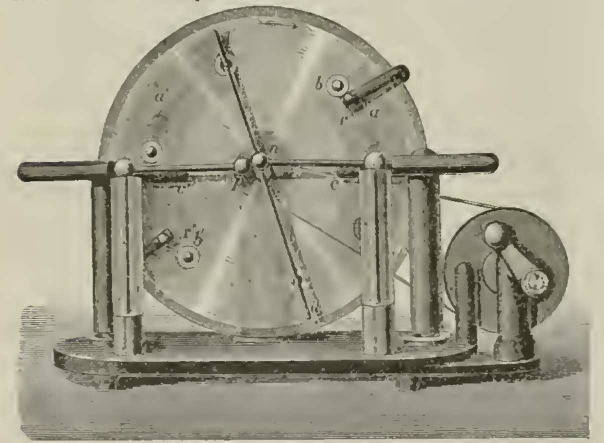

Fig. 85.—Töpler-Holtz Machine.

In front of the revolving plate is seen a metal rod bearing metallic combs which approach near to but do not touch the glass, each comb having its central tooth replaced by a tinsel brush. This may be known as the *neutralizing conductor*. Below this may be seen two horizontal rods known as *discharging conductors*, and also bearing metallic combs.

Assuming the inductor at the left to have an initial charge of positive electricity, the action of the machine may be explained as follows (Fig. 86): Beginning with two carriers, as n and n', the + E of n is repelled and is taken up by the tinsel brush of the neutralizing conductor A, while its — E is carried on. At the carrier marked n' the same process takes place, its — E being repelled and escaping upon the neutralizing rod B, while its + E is retained. As the two carriers, one charged with + E and the other with — E pass under the tinsel brushes at C they give up their charges to the inductors on the field plate, and thus keep up the charges of the latter. The + E and — E which pass into the conductor A. B. neutralize each other, leaving the rod free to take the repelled electricities from the next pair of carriers. The office of the carriers and the rod A. B. is thus to maintain a constant and relatively high potential in the inductors of the fixed plate.

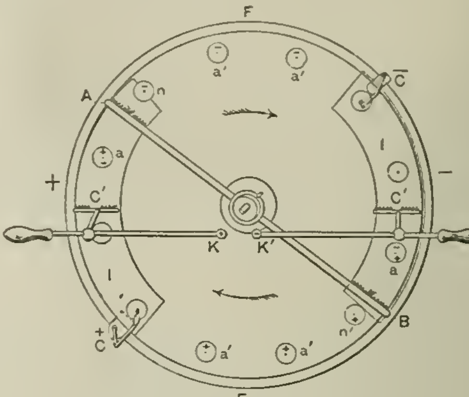

Fig. 86.—Diagram of Töpler-Holtz Machine.

The inductors in turn act upon the combs of the discharging conductors, the + inductor attracting the — E of the comb opposite it and repelling its + E to the end K, and the — inductor attracting the + E of the other comb and repelling the — E. to the end K'. The two ends K and K' are thus oppositely charged, and when placed at the right distance apart a succession of sparks will pass between them with a snapping sound. The illustration of the machine shows in addition a jar attached to each discharging conductor, called a *condenser* whose action is to decrease the number and increase the intensity of the sparks passing between K and K'.

The Condenser of the Leyden Jar.—A condenser consists of two conducting surfaces separated by a dielectric. One of the most common forms is the Leyden Jar. (Fig 87.) This consists of a jar of hard glass, covered outside and lined inside with tin foil, the two coatings reaching to an equal height about two-thirds of the way up the sides. The stopper is of well seasoned wood, varnished, and perforated with a brass rod which connects with the tin foil inside and terminates in a ball at the top. The jar is charged by connecting one of its coatings with the earth and the other with the conductor of an electrical machine. The outside of the jar thus receives a charge of electricity of one sign and the inside an equal charge of the opposite sign. When the two coats are connected, as by touching simultaneously the ball and the outer coat, a discharge passes through the connecting body, and the jar is discharged. When the outer coats of several jars are connected by placing them on a sheet of tin foil, and their brass rods are all connected by a wire the combination constitutes a *battery*, and a discharge of one jar to its coating results in the discharge

Fig. 87.—Leyden Jar.

of all. A battery is, in fact, a single condenser whose capacity is equal to the sum of the capacities of the jars which compose it.

Seat of the Electric Charge.—If a jar be constructed so that it can be taken apart, as in the illustration (Fig. 88), and after charging the coatings are tested separately, they will not cause divergence of the leaves of the electroscope. Hence the seat of electrification cannot be in the coatings of the jar. If the glass be tested it will be found to be electrified. If now the jar be put together again it can be discharged in the usual manner by connecting the outer and inner coatings. Therefore the seat of the charge is the surface of the dielectric. The office of the tin foil is to serve as a conductor for the glass surface, enabling all portions of the latter to discharge itself at once.

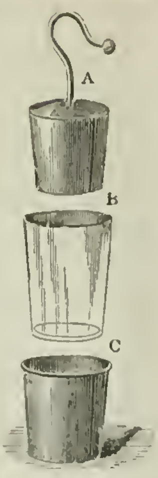

Fig. 88.—Separable Leyden Jar.

FROM THE FRENCH CAPITAL.

(*Special Correspondence.*)

Paris, Nov. 8, 1897.

The committee for the revision of the French Codex (1900 edition) has commenced work. M. Liard, director of primary education, is chairman; the vice-presidents are MM. Planchon and Brouardel, heads of the School of Pharmacy and Faculty of Medicine. The other members are Professors Bourquelot, Jungfleisch, Moissan and Prunier of the Paris School of Pharmacy, Dr. Roux, of serum fame; Prof. Adam of the Alfort Veterinary School; M. Marty, chief army pharmacist; Professors Gilbert, Landouzy and Pouchet of the Faculty of Medicine, and the well known Paris pharmacists MM. Vigier and Yvon. Circulars have been issued to the schools, syndicates and Societies of Pharmacy throughout France asking for their views and suggestions; the Paris and Lyons syndicates have already replied. The committee have practically decided on three points, alphabetical classification, addition of a list of re-agents for testing medicaments and insertion of all names in French and Latin, as well as other languages when possible. The proposition of introducing a maximum dose in the case of active medicaments, supported in some quarters, seems less likely to be adopted.

STATUES.

The Paris Municipal Council has voted $600 towards Lavoisier's statue and granted a site behind the Madeleine, not far from the unfortunate savant's last home. Barrias is to be the sculptor.

Dr. Caventou, the president of the Academy of Medicine, has subscribed 3,000 francs to the Pelletier-Caventou memorial.

CHICAGO UNIVERSITY

and the work of Mr. Harper and Mr. Rockefeller was the subject of M. Moissan's address to the "Five Academies" at the Institute of France on Oct. 25. In his happiest style, he described the remarkable rise and progress of the institution in question, pointing out in amusing and forcible language the characteristics of self help and self reliance which he so much admires in American men and manners. He mentioned Mr. Green's gift for Princeton laboratories, John Hopkins' legacy to Baltimore, and Leland Stanford's bequest to California, and advised his countrymen to "go and do likewise."

AMONG THE PERFUMERS.

Lubin's perfumery will celebrate its centenary by removing to the rue Royale next year. A few doors off their new premises another well known firm, Delletrez, is likewise preparing to open shop. Lentheric, a hundred yards away, had a disastrous fire in his basement a few weeks ago, but I cannot obtain official information as to whether a large quantity of otto of roses was destroyed as was reported.

NEW REMEDIES AND NEW IDEAS.

Dr. Penières, of Toulouse, states that surgical tuberculosis can be cured by injections of resin of euphorbia.

M. Carrosquilla's serum for leprosy has been tried at the St. Louis Hospital (Paris) without satisfactory result.

The Parisian journals announce the discovery of a new local anæsthetic by MM. Einhorn and Heinz, of Germany. "Orthoforme" is stated to be a crystalline white powder, odorless and tasteless, its chemical description being "p-amido-m-oxy-benzomethylic ether."

An apparatus for determining the exact location of projectiles in the human frame is the latest novelty at the Faculty of Medicine. Bullets were fired at seventy yards into the head of a corpse, and their position determined by the new instrument, in presence of various French and foreign savants, a Mexican and a Japanese among others.

Speaking of Mexico I may mention that Profs. Altamirano and Morales were present at the October meeting of the Paris Society of Pharmacy, were formally welcomed by the president, and informally but cordially chatted to round the fire after proceedings were over.

Referring to the Luetgert murder trial at Chicago, Dr. Bordas, of the Paris Municipal Laboratory, says that a fortnight or so will suffice to entirely dissolve a corpse or carcass in a tun of sulphuric acid containing lead ingots. If lime be added, the result makes excellent manure. But a hundred pound corpse would require about 70 gallons of acid, not an easy quantity to purchase or handle secretly.

A PHARMACIST EXPLORES UNKNOWN SUMATRA.

M. Raoul, one of France's leading naval pharmacists, sent by the government to the East Indies to ascertain the commercial possibilities and raw products of Sumatra, etc., has returned with some interesting botanical specimens and valuable information. Among his collections are trees producing various oleaginous substances, resins, varnishes, tannins and textiles and some new species of gutta percha plants. These treasures, brought to the coast at the cost of much trouble and anxiety, are to be sent to the French colonies.

The forests producing resin and india rubber are immense, and some gold and petroleum were also found. If these glowing accounts are not exaggerated, Sumatra only wants an enterprising race to open up its vast resources. The chief drawback of this particular Klondike are the innumerable snakes, but Dr. Calmette's serum was successfully used whenever a member of the expedition was bitten.

AT THE SCHOOL OF MEDICINE.

M. Blanchard, on entering on his new duties as professor of Natural History, made an inventory of the laboratory apparatus and collections, and found numerous articles missing. It would appear that some of the microscopical and botanical plant has been found in the possession of M. Heim, the assistant professor who temporarily occupied the chair before M. Blanchard's appointment. The Disciplinary Committee of the Paris University is inquiring into the matter.

ON THE "BOUL MICH.'"

The "Amicable Association of French Pharmacy Students," started last year, has just taken premises on the Boulevard St. Michel, close by the School of Pharmacy; and has started a monthly organ, "La Pharmacie Française," to which professors and students alike contribute. The introductory article was from the pen of M. Moissan, who took the opportunity of expressing his idea that an "Old Pharmacy Students Association," numerous and well organized, "could alone remedy the principal difficulties of the pharmaceutical profession"; while M. Planchon contributes one of his chatty and erudite historical sketches.

EXPERIMENTS WITH RAW COPPER,

made by M. Schlagdenhauffen, director of the Nancy School of Pharmacy, formed the subject of his recent communication to the Academy of Sciences. He has discovered distinct traces of both arsenic and antimony in the smelted metal.

M. JULLIARD,

the "Doyen" of the Paris Society of Pharmacy, has just made his first appearance as an author. At 75 years of age, and with half a century of practical experience behind a drug store counter, he has embodied some useful hints to budding pharmacists in an unpretending little work, "Pharmaceutical Practice," his pupil, M. Fumouze, being his collaborator. M. Julliard is one of the best known faces at most pharmaceutical gatherings, and he has done some useful work on hygiene committees, etc. Still hale and hearty, his years sit lightly enough upon him, and he is popular alike at scientific and social gatherings.

M. Julliard.

PHARMACY.

CYCLEA PELLATA (Menispermaceæ) has been examined by Doorsma. He found in the root 2.5 p. c. of a non-crystallizable alkaloid having a very bitter taste, and called by him "Cycloin." It resembles Buxin. (Phar. Post.)

PROTECTIN is a covering for bandages, prepared by Evers & Pistor in Kassel. It consists of thin tissue paper, coated on one side with a solution of caoutchouc. For transportation it is rolled together with starched gauze and sterilized. (Ap. Zeit.)

DI-IOD-ACETYLENE (C_2I_2) crystallizes in small colorless needles, has a disagreeable odor, is volatile, and dissolves readily in all ordinary solvents. Exposed to light it becomes reddish. It kills all micro-organisms and prevents all decay. (Phar. Post.)

TAMAQUARE.—The use of this preparation, which has been used with encouraging results in eye clinics for affections of the cornea, having become assuredly regular, the manufacturers have reduced the price one half. (Phar. Post.)

GASTROMYXIN.—The dietetic laboratory of Gust. Herites in Prague announces a preparation of the above name from the mucous membranes of beef stomachs, which is intended to produce pepsin in the stomach and to be used in cases where the appetite needs stimulation. (Phar. Post.)

DURIT is a substitute for caoutchouc and is used for the manufacture of objects that are to be exposed to extremes of temperature. It will stand a temperature of 200° C. and is not affected by the air, nor by acids, ammonia, and phenol, and remains elastic for years. Articles for surgical use are made from it. (Ph. Post.)

DIABETICO, a preparation of agreeable odor and taste, and effervescing, is recommended to diabetics as a beverage. According to an analysis by Dr. Aufrecht (Ph. Zt.) it is an aqueous liquid containing: Alcohol, 8.25 p.c.; extract, 3.25 p.c.; minute quantities of tartaric, phosphoric, sulphuric, and carbonic acids, mineral salts, saccharin, and glycerin. (Ph. Post.)

TRIPHENIN.—A new antipyretic and antineuralgic. Doses of 0.5 to 0.6 gram (8 to 10 grains) suffice to reduce the temperature 2 to 3° in fever, while for an analgesic action 1 gram (15 grains) 3 or 4 times daily is necessary. Forms white crystalline plates, easily soluble in alcohol. It is absorbed slowly and has no unpleasant after effects. Best given in powder form or in cachets. (Phar. Post.)

FUMIGATING PASTILLES.—To imitate Zampèroni's pastilles called "fidibus insettifughi," A. Janssen gives the following directions: 240 gram of best quality insect powder in not too fine powder are mixed with a solution of 25 gram potassium nitrate in 300 cc. of water, the mixture dried at a low heat and powdered. This powder is worked up with some stiff tragacanth paste and made into pastilles weighing 2.5 gram each and dried at a low heat. (Drog. Zeit.)

ISINGLASS is prepared principally from the air-bladders of sturgeons. The preparation in Russia consists in steeping the swimming bladders in water, removing carefully their external coat and the blood which often covers them, putting them in a hempen bag, squeezing and softening them between the hands, and twisting them into small cylinders. They are ready for the market immediately after being dried in the sun and whitened with fumes of burning sulphur.

IMPERVIOUS FLOORS.—In French hospitals the floors have been painted for hygienic reasons with a solution of paraffin in petroleum, which gives them a brown color and renders them entirely impervious. A single application is said to suffice for two years. Such floors may be wiped daily with a cloth saturated with an antiseptic solution. This device is of great importance to schools, hospitals and private houses. (Süd. Ap. Zeit.)

A NEW WASHBOTTLE.—Intended for thorough washing of gases. The gas enters through a tube, which reaches nearly to the bottom and has the end turned upward. An inverted funnel over the opening, terminating in a long spiral, causes the gas to divide into small bubbles, which force a small column of liquid upward through the spiral, thus keeping the gas in contact with the wash liquid for some time. When the liquid reaches the top of the spiral, it falls back and becomes mixed with the remainder, affording a complete circulation of the wash fluid. (Phar. Post.)

A NEW PROCESS FOR MAKING DIAMONDS has been discovered in Italy by Dr. Quirino Majorana. A fragment of carbon heated in the electric arc was subjected to a sudden pressure of 5,000 atmospheres by means of an explosion. The result was a black mass of graphite and amorphous carbon. By Berthelot's method of separation some microscopic crystals were found, mostly black and opaque, but having all properties of the diamond, particularly that of combustion. Moissan had heretofore considered a metallic solution necessary, but these results show that high heat and high pressure alone are sufficient to convert amorphous carbon into diamonds. (Süd. Ap. Zeit.)

PLATINUM is still obtained chiefly from the southern Ural Mountains, but New South Wales has also become an important source. While the production in 1880 was 2,946 kg, it rose in 1896 to 4,413 kg. The crude metal is worth about $75 per kg. Its purification is carried on exclusively in Germany, where even Russia has to obtain its pure platinum. The yield of iridium, which is always found associated with it, was last year 4.1 kg. (Ap. Zeit.)

LOCAL ANÆSTHESIA THROUGH GUAIACOL is effected by applying to the skin a compress saturated with guaiacol and covering this with some impermeable stuff to prevent evaporation. Complete anæsthesia takes place within 10 minutes. A rise in temperature of ½ to 1° C. is noticeable immediately after application, and then a fall. The latter comes simultaneously with the anæsthetic effect. Subcutaneous injection is also recommended, 2 cc. being sufficient to render insensible a considerable surface. (Phar. Post.)

ENTERORUSE is claimed to be a perfect substitute for all kinds of food. It contains 18 p.c. albumen, 11 p.c. fat, and 60 p.c. carbohydrates. Also, enough diastase to effect an easy assimilation of the starch. The proportions of the principal constituents are the same as in milk. The preparation has been found to be of particular value in diarrhœa of children and adults. It is given in tablespoon doses every one to three hours to adults, children in proportion. During its use no other food is necessary. (Phar. Post.)

PROTARGOL.—A chemical combination of a proteid with silver. It is a fine, yellowish powder, easily soluble in water. The solution is not affected by albumen, sodium chloride in weak solution, diluted hydrochloric acid, or caustic soda. The preparation is claimed to have given excellent results in gonorrhœa, also as a bactericide and in the treatment of wounds. It is used in 0.25 to 1 p.c. solution, and should be kept in amber glass. Differing from other silver preparations, it does not leave spots on the skin or linen. (Ap. Zeit.)

ORTHOFORM (p-amido-m-oxybenzoic acid methyl ester) is a voluminous, odorless and tasteless powder, which is but little soluble in water, therefore preferable to all known anæsthetics. It has been found useful in dermatological practice as well as in surgery, and has also given excellent results in cases of ulcerated stomach. Being absolutely nonpoisonous, it may be used externally ad libitum; internally it is given several times daily in doses of 0.5 to 1 gram (7 to 15 grains). Its antizymotic action makes it unnecessary to sterilize it. (Phar. Post.)

TAPIOCA.—The article which is commercially known in this country as tapioca, is obtained from the tuberous roots of Cassava or Manioc plant, a native of Brazil. It is imported in three forms, "pearl tapioca," "flake tapioca," and "tapioca flour." The first two forms are exclusively used for food. Tapioca flour is also commercially known as "tapioca," and is used to a slight extent for the thickening of soups, but mostly by calico printers and carpet manufacturers to thicken colors, and in the manufacture of a substitute for gum arabic or other gum. Eighty-five per cent. of it consists of starch.

CHINOSOL AS A PRESERVATIVE OF DISSECTING MATERIAL.—Experiments have shown that a solution of 25 gm. of chinosol in 4 liters of water diffused through a body will preserve it for several weeks. The solution is run in through an artery, and this followed up with ½ liter of water to force the disinfectant from the arteries into the small blood vessels. The fluid diffuses well throughout the body except the skin. The colors are not changed, even the blood vessels and blood retain their normal appearance. The muscles smell of chinosol and the brain becomes slightly yellowish. Sometimes the skin becomes discolored on keeping. The disinfection is more than sufficient for the time the bodies remain in the dissecting room, and they may be kept for several weeks before using. For disinfecting the hands and possible wounds a solution of 1 in 500 is convenient. (Phar. Post.)

TERRA ALBA is well known commercially, but not much mention is made of it in leading text books. It is an almost pure sulphate of lime ground and bolted, and is chiefly used in the manufacture of paper. There are three forms of ground gypsum, or ground sulphate of lime, well known commercially: (1) Plaster of Paris, which contains more or less carbonate of lime; (2) land plaster, which is a coarse and cheap article, and (3) terra alba, which, as before stated, is an almost absolutely pure sulphate of lime containing no carbonate and being ground and bolted.

COAL TAR PREPARATIONS, in the official language of the authorities of the customs service, are products of fractional distillation of coal tar or are chemical compounds of which some essential and characteristic element is derived from coal tar. The number already known is very great, and the possibilities of their increase seem to be unlimited. In some form they are used in almost every art, trade and profession. In their chemical constitution they range from the simple combination of two or three elements to the most intricate and complex combinations known to science.

"DEAD OIL" is composed of a variety of bodies, including naphthaline, neutral oils and tar acids in variable proportions. It is used for a variety of purposes, according to quality, including the manufacture of lampblack, varnishes, stains, disinfectants, waterproof paper, paving cements, and largely for the preservation of wood, by the process called "creosoting." It is known in commerce as either "dead oil," "heavy oil," "tar oil," or "creosote oil," the first being its more common name. It is known commercially as an oil, and although containing more or less carbolic acid as a valuable ingredient, it is not known in trade by that name.

INVISIBLE INK.—The following formula is recommended:

Lead acetate	1. gram
Uranium acetate	0.1 gram
Bismuth citrate	1. gram
Distilled water, to	100. gram

Dissolve and cautiously add ammonia water until the solution is clear. A few drops of syrup or gum arabic solution are then added. It is applied with a quill or a wooden pencil. The writing is invisible, but at once becomes brown-black when exposed to vapors of sulphuretted hydrogen, remains legible for a few minutes, then fades to a light-brown, but reappears on moistening with highly dilute nitric acid and may be regenerated. As a source of sulphuretted hydrogen serve liver of sulphur and vinegar, boiled egg, etc. (Phar. Post.)

BLACKBOARDS IN SCHOOLS.—The color of school exercise boards is a matter of great importance, but has been strangely neglected. For, from time immemorial, it has been a fact of common knowledge, even among uneducated people, that black is the worst of colors for the eyes; hence, it has long been a custom with tailors, to charge more for making a black suit of clothes, than for any other color. For many years an exchange has given school room hygiene much special study, and taught that school exercise boards should not be black. The best color for such boards is some shade of cream white, a dead surface of soft, mellow tint, varied in its degree of whiteness to suit the quality and quantity of light afforded. The crayons for exercise boards, for ordinary daily use, should be a clear sky-blue color; the extra colors, a canary orange and a clear dark green.

CONSTITUENTS OF DIGITALIS.—Kiliani criticises Keller's statements regarding the active constituents and method of valuation. According to Keller the leaves, as well as seeds, contain digitoxin, digitonin and digitalin. For determining the value of the drug he considers an estimation of the digitoxin sufficient. Kiliani, on the other hand, declares Keller's digitonin to be a mixture of various amorphous substances, and further considers it proven that his own "digitalinum" verum" is a heartpoison and must also be taken account of in the valuation. He also reports the presence of another heartpoison, digitophyllin, a glucoside differing in its properties considerably from digitoxin, and probably identical with Nativelle's "digitaline cristallisée." Finally the author acknowledges his inability to speak with absolute certainty of the presence or absence of "digitalinum verum" in digitalis leaves. (Arch. Phar., vol. 235, No. 6, through Ap. Zeit.)

CAYENNE PEPPER is prepared from the dried fruit of various species of capsicum. Chillies and bird peppers are largely used by manufacturing druggists for making capsicum plasters and other medicinal preparations, and also by spice dealers for making the article commercially known as cayenne pepper, which seems to be a mixture of capsicum, rice flour and other ingredients. Cayenne pepper is manufactured from the ripe fruits, which are dried, ground, mixed with wheat flour and made into cakes with yeast; the cakes are baked hard until like biscuit, and then ground and sifted. The pepper is sometimes prepared by simply drying the pods and pounding them fine in a mortar. From conclusions of the Board of Appraisers, it would seem that pepper made from the genuine cayenne peppers is almost unknown in this country, and there is no evidence to show that the genuine cayenne peppers are ever imported into this country.

RESORCINE.—To produce resorcine, benzole is treated with concentrated sulphuric acid, and the resulting body, known as benzene-disulphonic acid, when fused with caustic soda, yields a new chemical constituent called resorcine, resorcinol, or dihydroxy-benzole. As expressed in the technical language of experts, "The benzole ring, consisting of six atoms of carbon, maintains its constitutional structure after the benzole becomes transformed to resorcin, and of the elements existing in resorcine, coal tar gives 69.09, and other sources 30.91 = 100 per cent." The substance is obtained in crystalline form, and is of a brownish white color. It has no tinctorial power, but is used in the manufacture of fluoresceine, bromo fluorescic acid, eodine, and perhaps other so-called coal tar dyes, the products of subsequent chemical combination and manipulation. For tariff purposes the Board of General Appraisers ruled that it was a chemical compound, and a preparation of coal tar, not a color or dye.

A COFFEE SUBSTITUTE has been found by the Board of General Appraisers of this port (Synopsis G-A 14, 782), to be a preparation of which chicory is the chief component part in quantity and value. An importation was invoiced as "chicory," and, in a review of a case involving the dutiable classification of the article, the Circuit Court of Appeals used the following language: "The merchandise is a well-known article composed of chicory or chicory root (which are commercial convertible terms), beet root, olive oil and syrup. It is manufactured in Germany by grinding these ingredients together, and when imported is in the form of rows or cylindrical sticks, each of which is enclosed in a wrapper upon which the directions are printed. Chicory is about 68 per cent. of the weight and about 44 per cent. of the value of the compound article. It, like at least two other similar compounds made by other manufacturers, is used to some extent to flavor coffee, and more largely, both in Germany and in this country, to mix with coffee or as a substitute for coffee, for purposes of economy. Chicory is also used by dealers as an adulterant to mix with ground coffee and by consumers to mix with or as a substitute for coffee."

COMPARATIVE VALUE OF VARIOUS DISINFECTANTS.—Compiled by A. Gawalowski (Phar. Post). A ½ p.c. solution of corrosive sublimate serves as standard.

	Disinfectant.	Anti-septic.	Deodorizer.
Corr. sublimate solution (½ p.c.)	100	100	..
Carbolic acid	50	50	40
Sulphurous acid gas	50	50	50
Thymol (solid)	50	50	40
Kreosote (100 p.c.)	50	50	40
Antimonium-Bayer	50	50	40
Antimycelin-Gawalowski	50	50	40
Ferrous sulphate (cryst.)	40	50	30
Ferro-zinc sulphate (cryst.)	40	50	40
Iron oxide	40	10	15
Ferro-zinc-magnesium sulphate	40	30	30
Copper-zinc sulphate	35	40	40
Ferro-zinc-copper sulphate (cryst.)	35	35	40
Zinc carbolate (dry)	30	40	45
Sulphites (containing 10—40 p.c.)	15—25	15—25	15—25
Permanganates (solid)	25	10	50
Salicylates (solid)	25	25	25
Kreolin	25	25	40
Lysol	25	25	40
Carbolates of lime	2½—20	2½—20	2—15
Chlorine gas	15	..	50
Ferro-zinc-calcium sulphate	15	30	40
Raitzer's inodorous disinfecting powder	13	35—40	30
Ferric salts (40—50 p.c. solutions)	10	10	5
Zinc salts (cryst.)	10	..	40
Chlorinated lime	5	..	15
Gawalowski's sulphurous acid perfume (fluid alcoholic)	8	8	5

That the druggist is the proper and ideal, and may some day be the actual, chemist of the common people is not to be gainsaid. Not a few prophesy the not far distant divorce of the professional from the mercantile branch of the drug business, and the salvation of pharmacy in the development of the former division. Very many druggists are already well equipped for this service and ready for the divorce. They are good chemists, toxicologists and bacteriologists, in addition to being good pharmacists. All that is needed to get the public to recognize them in this capacity is a little pushing of their claims. Therefore, we are glad to note that a Grand Rapids druggist is a candidate for the position of milk inspector, and is said by his friends to be exceptionally well qualified for the work of that office. Druggists are now expected and required to guard the drugs and medicines of the people; it will be a good thing to put the supervision of the food supply into their hands. But they must be well equipped.

In a letter which the Maine Commission of Pharmacy has recently sent to suspected violators of the pharmacy law occur these sentences:

> If you are doing any business which is not in strict accordance with the law, would advise an immediate compliance with all its requirements. * * * *
>
> Complaint having been made against you for violation of the pharmacy law, unless you immediately comply with its provisions, action will be taken against you.

Attention is particularly directed to a portion of the law which reads:

> Section 8. If any person shall hereafter engage in or be found in charge of or carrying on the business of apothecary contrary to the provisions of this act, he shall upon indictment and conviction be subject to a penalty of fifty dollars per month for the first offense, and one hundred dollars per month for each and every subsequent offense.

The stores notified are hustling for clerks and registered apothecaries are in demand at good salaries.

The police of Providence, R. I., have solved the Sunday closing problem for druggists of that city by ordering them to close up all day. And why not?

QUESTION BOX

The object of this department is to furnish our subscribers and their clerks with reliable and tried formulas and to discuss questions relating to practical pharmacy, prescription work, dispensing difficulties, etc.

Requests for information are not acknowledged by mail and ANONYMOUS COMMUNICATIONS RECEIVE NO ATTENTION; neither do we answer queries in this department from non-subscribers.

Ichthyol and Collodion.

(D. K.) sends in this prescription and asks us to submit it to the Era's readers:

Ichthyol	4 drams
Collodion	1 ounce

Mix and apply with a camel's hair brush (?). How should it be dispensed?

Analysis of Lithia Waters.

(G. & T.) See Bulletin of the United States Geological Survey, "Mineral Waters." You can probably secure a copy of this publication by addressing the Secretary of the Interior, Washington. Some additional information may be found in a paper published in the Journal of the American Chemical Society for June, 1890, by Prof. E. Waller on the "Determination of Lithia in Mineral Waters."

Liniment in Tablet Form.

(H. E. A.) We know of no definite formula for a liniment in tablet form. It is possible to incorporate essential oils or other substances used in liniments in tablet form, which, by solution in alcohol or other solvent may be used for external application. One of the essential parts of a liniment, however, is the vehicle or solvent and a preparation without a fluid or semi-liquid body can hardly be called a liniment.

Liquid Bluing.

(J. H. P.) An extended article on the preparation of laundry blues appears in this journal, Aug. 27, 1896, page 274. Here are some formulas:

(1) Dissolve aniline blue (6B) in cold water.

(2) Dissolve indigo sulphate in cold water and filter.

(3)	Soluble blue	2 drams
	Oxalic acid	½ dram
	Water	2 pints

Other formulas may be found by consulting the indexes of previous volumes of the Era.

Witch Hazel Jelly.

(C. R. M.) Following is the formula you describe:

Mucilage of Irish moss, N. F.	4 fl. ounces
Glycerine	6 ounces
Distilled extract witch hazel	4 fl. ounces
Cologne water	2 fl. ounces
Sodium borate	30 grains

Dissolve the sodium borate in the extract of witch hazel, mix with 3 fluid ounces of glycerine and the cologne, add slowly to the mucilage previously mixed with the remainder of the glycerine. After standing a few hours strain the mixture.

Mercuric Chloride, Fowler's Solution and Syrup Iodide of Iron.

(Bichloride) asks criticism upon this prescription:

Mercuric chloride	1 grain
Fowler's solution	48 drops
Syrup iodide of iron	6 drams
Elixir cinchona, enough to make	6 ounces

The above is incompatible and should not be dispensed. The reactions which may occur depend upon the order in which the ingredients are combined. Thus Fowler's solution is incompatible with mercuric chloride, the alkali bicarbonate which it contains causing a precipitation of the mercury. Mercuric chloride is also incompatible with syrup iodide of iron and elixir of cinchona. Then syrup iodide of iron is also incompatible with everything else in the prescription. A much more incongruous mixture can hardly be devised.

Questions Asked by Boards of Pharmacy.

(J. W. McK.) Examination questions asked by boards of pharmacy have been published in this journal as follows: Georgia, Jan. 1, 1892, page 9; Virginia, Dec. 15, 1892, page 362, and Dec. 15, 1893, page 581; California, Feb. 21, 1895, page 231, and March 5, 1896, page 298; Washington (State), March 15, 1892, page 169; Aug. 15, 1893, page 191, and Nov. 21, 1895, page 650; Michigan, Jan. 1, 1889, page 35; Illinois, Sept. 15, 1891, page 169; Wisconsin, Jan. 15, 1892, page 42; North Carolina, Jan. 15, 1893, page 55; Mississippi, Dec. 1, 1893, page 534, and Aug. 15, 1895, page 220; Colorado, Feb. 7, 1895; Nebraska, Sept. 10, 1896, page 333. We do not answer queries by mail.

Medical and Dental Courses in American Universities.

(Dane, New South Wales.) The following high grade universities in the United States offer courses in both medicine and dentistry: Harvard University, Cambridge, Mass.; University of Michigan, Ann Arbor, Mich.; University of Pennsylvania, Philadelphia, Pa.; Northwestern University, Evanston (Chicago), Ill.; University of California, Berkeley, Cal.; Johns Hopkins University, Baltimore, Md. There are a number of other institutions, but those named are more particularly of the character you outline. We have not at hand the data to give you the comparative cost of a five years' residence in these institutions. We suggest, however, that you address a specific inquiry to the executive officer of each of the universities named for catalogues outlining the courses of study offered, fees, etc. These officials will also furnish you an estimate of the expenses of living in their respective localities. Graduates in dentistry of Harvard University, Michigan University and possibly one or two other institutions are permitted to register in England, we believe, without further examination.

Mercuric Chloride, Alkaloids, etc.

(J. T. R.) submits the following:

Mercuric chloride	¾ grain
Strychnine sulphate	1 grain
Quinine sulphate	1 dram
Solution arsenous acid	1 dram
Tincture ferric chloride	2 drams
Basham's mixture, enough to make	4 ounces

This prescription will produce a comparatively clear mixture by adding the tincture of iron and solution of arsenous acid to about three ounces of Basham's mixture (freshly prepared) and dissolving in the resulting liquid the alkaloidal salts. The mercuric chloride is then added dissolved in a little water and enough more of the Basham's mixture to make four ounces. Upon standing a short time precipitation of the alkaloids will occur, due to the incompatibility of mercuric chloride with them. The presence of considerable acid and the glycerin of the Basham's mixture retards this precipitation somewhat, but the danger lies in the precipitation of the strychnine. The prescription should not be dispensed.

Petroleum or Spirituous Hair Wash.

(L. L.) We cannot give you the formula for the English proprietary "hair wash." Considerable notoriety has been given to petroleum hair washes, compounds containing benzoline or petroleum ether, in English courts recently, as some serious accidents have occurred where the inflammable vapor of the benzoline became ignited, in one or two instances resulting in the death of the persons using it. The authorities and the medical and pharmaceutical journals have very generally held that druggists were not justified in selling such dangerous liquids for the purpose, though so far as we can learn there appears to be no law prohibiting such sales. Some time ago the "Chemist and Druggist" (London) published the following formula for a spirituous form of wash for dry shampoo, which dries almost as quickly and gives off much less dangerous vapors:

Spirit of ammonia	4 drams
Tincture of quillaia	4 drams
Essence boquet	2 drams
Rectified spirit, to	8 ounces

Rub well into the hair, and rinse with a larger quantity; then rub dry with a soft towel. The operation should be conducted in the daytime.

Crab Apple Perfume.

(R. P. C.)

(1)	Extract orange blossoms	1,000
	Extract violet	1,000
	Extract rose	500
	Extract jasmine	500
	Extract acacia	500
	Essence vanilla (1 to 500)	100
	Tincture tolu (1 to 10)	30
	Essence musk (1 to 50)	15
	Cumarin	5
(2)	Tincture ambergris	1 ounce
	Tincture musk	3 ounces
	Spirit rose	16 ounces
	Extract cassie	10 ounces
	Extract tuberose	10 ounces
	Extract jasmine	10 ounces
	Extract violet	16 ounces
	Extract rose	32 ounces
(3)	Oil ylang-ylang	30 drops
	Oil mace, liquid	10 drops
	Oil wintergreen	2 drops
	Oil linaloe	20 drops
	Oil coriander	20 drops
	Oil hyacinth geraniol	5 drops
	Tincture cassie	2 ounces
	Tincture violet	4 ounces
	Tincture musc baur	¼ ounce
	Tincture styrax	½ dram

Mix and filter if necessary. (Griffiths' "Non-Secret Formulas.")

The name "crabapple blossom" as applied to a perfume is claimed as a trade mark by a manufacturer.

White Pine and Spruce Expectorant.

(T. & R.) The following formula contains the ingredients in the proportions you name:

White pine bark	5 tr. ozs. —	160 grs.
Balm of Gilead buds	4 tr. ozs. —	128 grs.
Spikenard	4 tr. ozs. —	128 grs.
Wild cherry bark	3 tr. ozs. —	352 grs.
Ipecac		256 grs.
Sanguinarine nitrate		16 grs.
Morphine acetate		64 grs.
Ammonium chloride	1 tr. oz. —	32 grs.
Chloroform	1 fl. oz. —	32 mm.
Es'n'c of spruce compound	4 fl. ozs. —	
Sugar	6 lbs.	
Alcohol,		
Water,		

Syrup, of each, a sufficient quantity to make a gal.

Reduce the vegetable drugs to a moderately coarse (No. 40) powder, moisten the powder with a menstruum composed of 1 volume alcohol and 3 volumes of water, and macerate for 12 hours. Then percolate with the same menstruum until ½ gallon of tincture has been obtained, in which dissolve the sugar, sanguinarine nitrate, morphine acetate, ammonium chloride, add the essence of spruce compound and enough syrup to make the whole measure 1 gallon; strain.

The essence of spruce compound is used as a flavoring agent and may be prepared as follows:

Oil of spruce	4 fl.drams
Oil of lemon	1 fl. dram
Oil of wintergreen	½ fl. dram
Oil of sassafras	½ fl. dram
Purified talcum	1 ounce
Alcohol	20 fl. ounces
Water	12 fl. ounces

Dissolve the oils in the alcohol, triturate the talcum with the water, add the alcoholic solution, allow the mixture to stand several days, occasionally agitating, then filter.

For similar formulas see issues of this journal March 25, 1897, and April 1, 1897, pages 363 and 393 respectively. A formula for compound syrup of white pine may be also found in the National Formulary.

Dispensing Capsules.

(C. J. K.) The following rules, read at a meeting of the A. Ph. A. two years ago, answer very fully the points raised in your query whether the ingredients of a prescription to be dispensed in capsules should be first made into a mass:

1. Always follow the physician's directions as to the formation of a mass.

2. If no directions are given form a pill mass whenever the ingredients cannot be mixed in powder form. Weigh the mass, divide the weight by the number of capsules ordered, weigh each part and give it the shape of a small cylinder by rolling it between the thumb and first finger. Wash the fingers and introduce the cylinders into the capsules by means of a needle.

3. If no directions are given and the ingredients of the prescription will form a powder, divide their combined weight by the number of capsules ordered, weigh each powder separately and introduce it in powder form into the capsule by means of a convenient apparatus. Under no condition should the undivided powder be forced into the capsules by moving the bodies and covers through the powder from opposite directions.

Some dispensers recommend introducing the cylindrical pieces into the capsules held in the left hand by the aid of a long needle, taking up the cover with two fingers of the right hand holding the needle and quickly slipping it into position, thus avoiding all contact of the mass with the outside of the capsule. The habit of putting pills into capsules with the fingers is censurable, and an evidence of bad training.

Curare.

(W. De V.) Curare may be obtained from Lehn and Fink of this city. They inform us that the alkaloid curarine is not generally carried in stock on account of the great difference in price of the two products, the size of the doses being nearly the same. One manufacturing house stated that it no longer listed curarine because there was but little demand for it. Curare as found in the market is a blackish-brown extract, brittle or hygroscopic, of a very bitter taste and almost completely soluble in dilute alcohol; cold water dissolves about 70 per cent.; this portion contains the poisonous alkaloids. Regarding its preparation the following abstract is taken from the account of Dr. Richard Schomburgk's observations in British Guiana (National Dispensatory, 1894): Bark of strychnos toxifera, Schomburgk, 2 pounds; Str. Schomburgkii, Klotsch, Str. cogens, Bentham (aurimaru), and wakarimo, of each ¼ pound; roots of tariteng and tararemu, of each ½ ounce; four small pieces of wood of a species of Xanthoxyleæ called manuea. An extract is made by boiling these articles with water, straining, and adding to the thick liquid the slimy juice pressed out of the fleshy root of a species of Cissus, called muramu; the mixture is further evaporated by exposing it to the sun. Other species of strychnos and many other plants have been named as being used in the preparation of this poison in different parts of South America. Coblentz (Newer Remedies) describes the alkaloid curarine as a yellow amorphous hygroscopic powder, soluble in water and alcohol.

Regarding the use of curare in practical medicine at present, Shoemaker says it is limited to the treatment of hydrophobia. The drug is very variable in composition and effects and although a certain measure of success has attended its employment in affections characterized by spasm, as chorea, tic douloureaux, epilepsy, tetanus, etc., yet different samples vary so greatly that many practitioners are of the opinion that it is of less practical value than would be inferred from its powerful physiological action.

The Era Course in Pharmacy

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FEES. The entire expense is only $7.75 per annum and includes subscription to the ERA, tuition fees and a binder for preserving copies and lectures.

LECTURE NO. 27.

Inorganic Chemistry.

Oxygen Acids of Nitrogen. Phosphorus.

Corresponding to the first, third and fifth of the previously named oxids are three acids, Hyponitrous, HNO, Nitrous, HNO_2, and Nitric, HNO_3.

Hyponitrous Acid is such an instable body that it is not known in the free state, but only in the form of its salts, the hyponitrites. Theoretically nitrous oxid is the anhydrid of hyponitrous acid, but on account of the instability of the latter substance it cannot be formed by dissolving the oxid in water.

Nitrous Acid is formed when nitrogen trioxid dissolves in ice cold water.

$$N_2O_3 + H_2O = 2HNO_2.$$

The free acid is, however, very instable and on warming quickly splits up into nitric acid, nitric oxid and water.

$$3HNO_2 = HNO_3 + 2NO + H_2O.$$

The salts of this acid, the nitrites, are comparatively stable bodies, They are distinguished from the nitrates by their greater solubility in alcohol, and by the liberation of nitric oxid on the addition of a weak acid, or by the release of iodin from iodids in the presence of acetic acid.

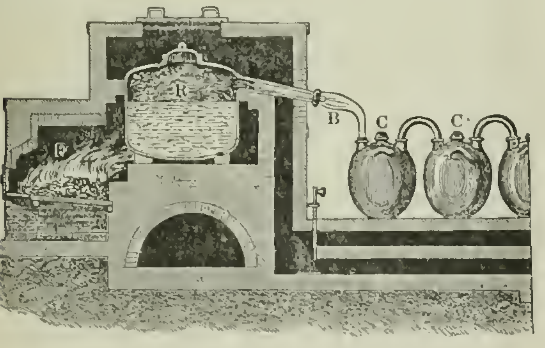

Fig. 32.—Distillation of Nitric Acid.

The nitrites are all soluble in water.

Nitric Acid is formed when the pentoxid dissolves in water.

$$N_2O_5 + H_2O = 2HNO_3.$$

This method of formation is of scientific interest only, as the acid of commerce is never prepared in this manner, but is obtained by the distillation of a mixture of sodium nitrate and sulfuric acid. (Fig. 32.) The reaction, which occurs in two stages, is as follows:

$$NaNO_3 + H_2SO_4 = HNO_3 + NaHSO_4.$$
$$NaNO_3 + NaHSO_4 = HNO_3 + Na_2SO_4.$$

On heating the mixture the volatile nitric acid passes over into the condenser, leaving the solid sodium sulfate in the retort.

The source of the nitrates in nature is the decay of nitrogenous matter in the presence of an alkaline base such as lime, potash or soda. Saltpeter, or Niter, has been prepared in this manner for centuries. In warm countries, as India, heaps of organic matter are allowed to decompose spontaneously and when sufficiently charged with niter, the salt is dissolved out by lixiviation and crystallized by evaporation.

In rainless districts of certain warm countries, as in Chili, large deposits of sodium nitrate are found, which are supposed to have been formed from the decomposition of sea animals and vegetation.

Pure Nitric Acid is a colorless, rather heavy liquid, of a peculiar smell, and if concentrated, fuming in the air. The commercial acid is usually colored by oxids of nitrogen dissolved in it. The most stable solution is that of a concentration corresponding to 68 per cent. of absolute acid. If a solution either weaker or stronger than this is heated in the open air it loses either water or acid until this strength is attained, when it remains constant until entirely evaporated. An acid of this strength has a specific gravity of 1.414 at 15° C. The official *Acidum Nitricum* contains 69.4 per cent. of absolute acid, and has a specific gravity of 1.42.

Nitric Acid is a solvent for many metals, dissolving them to form nitrates, with the evolution of nitric oxid and the production of water. Its action upon copper is typical.

$$3Cu + 8HNO_3 = 3Cu(NO_3)_2 + 2NO + 4H_2O.$$

If the acid be moderately dilute and the reaction take place at a low temperature, ammonium nitrate may be formed instead of nitric oxid.

$$4Zn + 10HNO_3 = 4Zn(NO_3)_2 + NH_4NO_3 + 3H_2O.$$

The acid is a powerful oxidizing agent both for organic and inorganic substances. It oxidizes ferrous salts to ferric, mercurous salts to mercuric, etc. It colors the skin, nails, hair, silk and wool yellow. With certain organic compounds, as cotton, glycerin, and benzole, the concentrated acid displaces part of the hydrogen, the group NO_2 combining with the remainder to form explosive compounds, as gun cotton, nitroglycerin, etc.

The Nitrates.—The salts of nitric acid, the nitrates, are an important class of compounds both in the arts and in pharmacy. Under the names of saltpeter and niter, potassium nitrate has long been known and used as a constituent of gunpowder. Its value for this purpose depends upon its ability to release oxygen readily for the oxidation of the combustible elements sulfur and carbon, which are also constituents of the mixture.

Analytically the nitrates are distinguished by adding sulfuric acid which frees the nitric acid, and then applying the usual tests for the latter. All of the normal nitrates are soluble in water.

Nitrohydrochloric Acid.—When nitric and hydrochloric acids are mixed both compounds are decomposed, with the formation of nitrosyl chlorid, NOCl, free chlorin and water.

$$HNO_3 + 3HCl = NOCl + Cl_2 + 2H_2O.$$

By the alchemists the mixture was denominated *aqua regia*, because of its property of dissolving gold, which property depends upon the free chlorin it contains. That it is not an acid is evident from the fact that it contains no hydrogen, except that present in the water.

The *Acidum Nitrohydrochloricum* of the Pharmacopœia is prepared by mixing 18 volumes of nitric with 82 volumes of hydrochloric acid, and when effervescence has ceased, transferring the product to amber colored, glass stoppered bottles.

PRACTICAL STUDIES.

NOTE: On account of the disagreeable fumes evolved, the following experiments should all be performed in a room having a good draught:

1. Place some dry starch in a test tube, add some nitric acid, attach a delivery tube and gently heat the mixture. Pass the reddish vapors into another tube containing ice cold water, and test the solution thus made for nitrous acid by adding to it a few drops of dilute solution of potassium iodid containing starch paste.

2. To a solution of sodium or potassium nitrite add a few drops of solution of potassium iodid and starch paste. Then add a few drops of acetic acid. The acetic acid sets free the nitrous acid, which releases free iodin, and this in turn colors the starch paste blue. Nitrates do not give this reaction.

3. Place in an evaporating dish some hair, silk or clippings of goose quills, cover with nitric acid and heat gently until the acid has evaporated. What effect does the nitric acid have upon the organic substance?

4. Place copper turnings, wire or foil in a test tube or evaporating dish and cover with nitric acid. When the reaction ceases evaporate the solution gently until acid fumes cease, cover to keep out dust and set aside to crystallize. What is the probable composition of the substance formed?

5. Add some nitric acid to a solution of indigo. If no change takes place, warm gently. What finally occurs?

6. Place some solution of potassium nitrate in a test tube, drop in a clear crystal of ferrous sulfate and add a few drops of sulfuric acid. Tap the tube gently. What takes place?

7. To some solution of potassium nitrate add some copper turnings or foil and then sulfuric acid. If necessary warm to start the reaction. How do the results compare with experiment 4?

PHOSPHORUS.

Symbol P. Valence 3, 5. Atomic Weight 30.96.

Historical.—The element seems to have been first obtained by the alchemist Brandt, of Hamburg, about 1669, by distilling the solid residue from evaporated urine with sand. Kunkel in 1678 published a pamphlet describing the substance and the method of its preparation. Robert Boyle also succeeded in preparing the substance in 1680 by distillation from a mixture of syrupy urine and white sand. Owing to its method of manufacture it was of necessity a very expensive product, and it was not until after the publication by Scheele in 1771 of the fact that bone consisted largely of calcium phosphate that the element began to be obtained from bone ash. Until 1772 it was believed to be a compound of "phlogiston" with an acid, but in that year the French chemist Lavoisier showed that when it burned the product weighed more than the phosphorus itself.

The name is from the Greek *phos*, light, and *phero*, to bear, and was originally applied to any substance which became luminous in the dark, as barium sulfid, etc.

Natural Occurrence.—On account of its great affinity for oxygen the element is never found in the free state, but always as the phosphates of calcium, aluminum, iron and other elements. One of the crystalized forms of calcium phosphate is known as apatite, and the aluminum compound as wavellite. The phosphates are quite generally distributed throughout the earth, the calcium salt being found in deposits of vast extent in Florida, the Carolinas, and in various other parts of the globe. The phosphates are essential to all fruitful soils, and are found in all vegetable and animal structures. Calcium phosphate is the chief solid constituent of the bony skeleton, and compounds of phosphorus are universally present in the brain and nerve tissues of the higher animals.

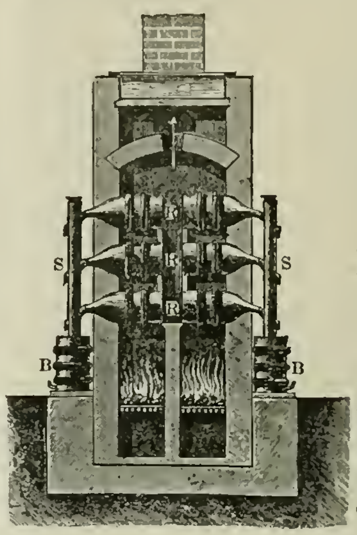

Fig. 33. Distillation of Phosphorus.

Preparation.—Phosphorus is usually prepared from the bone ash which is largely obtained from the spent animal charcoal of the sugar refineries. The bone ash, consisting mainly of calcium phosphate, is treated with dilute sulfuric acid, by which means a mixture of calcium acid phosphate and sulfate are obtained.

$$Ca_3(PO_4)_2 + 2H_2SO_4 = CaH_4(PO_4)_2 + 2CaSO_4.$$

The solution of the acid phosphate is poured off from the precipitated calcium sulfate, and the solid impurities of the bone ash, evaporated to dryness and heated to redness to produce the metaphosphate.

$$CaH_4(PO_4)_2 = Ca(PO_3)_2 + 2H_2O.$$

The metaphosphate is then mixed with charcoal and sand and heated in earthenware retorts, the phosphorus being reduced and distilling over, while calcium silicate is left behind in the retort. (Fig. 33.)

$$Ca(PO_3)_2 + 5C + SiO_2 = CaSiO_3 + 5CO + P_2.$$

On account of its ready inflammability the phosphorus vapor must, of course, be condensed and the solid preserved under water.

Description and Physical Properties.—Phosphorus is known in three well marked allotropic modifications, *octahedral amorphous* and the *rhombohedral* or *metallic*.

The octahedral, or colorless, modification is commonly seen in the form of translucent, yellowish sticks, of a hard, wax-like character. It is brittle at low temperatures, but at 15° can be easily cut with a knife. The outside of the sticks usually becomes covered with a whitish coating on standing. Its specific gravity is 1.83, and its melting point 44.3°. It is a non-conductor of electricity. In the absence of air its boiling point is 290°. It can be obtained in the crystalline state by gradual sublimation or by the evaporation of its solution in a volatile solvent. It is practically insoluble in water, sparingly soluble in essential and fixed oils and absolute alcohol, and freely soluble in such liquids as carbon disulfid, ether, chloroform, etc.

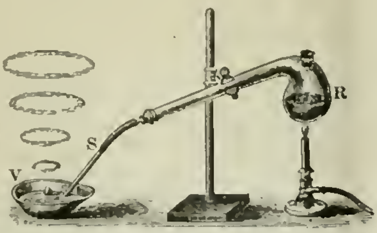

Fig. 34. Production of Phosphine.

The element is luminous in moist air, from its slow oxidation and the formation of phosphorous oxid. The fumes have a disagreeable garlic-like odor. If the action be allowed to continue, so much heat is evolved that the element at first melts and then takes fire, burning with a brilliantly luminous flame.

Both the element and its vapors are intensely poisonous. Workers in yellow phosphorus are especially liable to a necrosis of the bones of the face.

When the yellow or octahedral phosphorus is heated to 240° in the absence of air it is converted into the amorphous variety. This is usually seen in the form of a brown red powder, is insoluble in the solvents of ordinary phosphorus, permanent in the air, and non-poisonous. The specific gravity is 2.15. When heated to 260° it is reconverted into the yellow variety. The rhombohedral modification may be obtained by heating the red variety in a sealed glass tube to 580° C. Its specific gravity is 2.34, and in properties closely resembles the amorphous substance.

The principal employment of phosphorus is in the manufacture of matches. It is used considerably in chemistry, and to a slight extent in medicine.

COMPOUNDS OF PHOSPHORUS.

Hydrogen Compounds.—Phosphorus forms three compounds with hydrogen, PH_3, P_2H_4 and P_4H_2.

Phospin, PH_3.—Pure phosphin is a colorless gas, possessing an odor like rotten fish. It is commonly prepared by heating yellow phosphorus with milk of lime or a solution of caustic potash, and when obtained in this manner is spontaneously inflammable, owing to the presence of the liquid P_2H_4 which is also generated. The mixture when permitted to escape into the air in bubbles bursts instantly into flame, forming ring-like clouds of phosphorus pentoxid, which rise with a peculiar vortex motion. (Fig. 34.) The gas may also be ignited by heat, friction, sudden expansion, etc. The compound is also obtained when calcium phosphid is decomposed by water or acids.

Phosphin possesses feeble basic powers and is capable of uniting with negative elements to form salts known as the phosphonium compounds, as PH_4I, PH_4Br, etc. The gas is irrespirable and highly poisonous. The liquid P_2H_4, and the solid P_4H_2, are of still less interest and importance.

Halogen Compounds.—With the halogens, phosphorus forms a number of interesting tri- and penta-halides, as PCl_3, PCl_5, PBr_3, PI_3, PF_5, etc., which find their principal use as reagents in organic chemistry. They are all decomposed in the presence of water, yielding a halogen acid, and either phosphorous or phosphoric acid.—

$$PCl_3 + 3H_2O = H_3PO_3 + 3HCl.$$

$$PBr_5 + 4H_2O = H_3PO_4 + 5HBr, \text{ etc.}$$

Oxygen Compounds.—Phosphorus forms four, probably more oxids, but only two are deserving of consideration here. The trioxid, P_2O_3, is formed by the slow oxidation of the element, especially in the presence of water. Phosphoric oxid, or the pentoxid, P_2O_5, is formed by the further oxidation of the trioxid, or by the combustion of phosphorus in the air.

These oxids are known respectively as phosphorous and phosphoric anhydrid, because of their forming the corresponding acids when dissolved in water.

Oxygen Acids.—When phosphorous anhydrid dissolves in water phosphorous acid is formed.

$$P_2O_3 + 3H_2O = 2H_3PO_3.$$

When sufficiently concentrated the acid is a colorless, syrupy liquid, which on cooling forms a white crystalline mass.

Only two atoms of the hydrogen of this acid, can, under ordinary circumstances, be replaced by a metal, and hence the common salts of the acid are either primary or secondary phosphites, as NaH_2PO_3, and Na_2HPO_3, but not the tertiary phosphite, Na_3PO_3.

When phosphoric anhydrid dissolves in water the particular acid formed depends upon the number of water molecules taken up. When the proportions are one molecule of the oxid to one of water, the product is metaphosphoric acid, HPO_3.

$$P_2O_5 + H_2O = 2HPO_3.$$

When three molecules of water are combined with one of the anhydrid the product is orthophosphoric acid.

$$P_2O_5 + 3H_2O = 2H_3PO_4.$$

This is the phosphoric acid of chemistry and medicine. It is a colorless, syrupy liquid, and may form either primary, secondary or tertiary salts, as NaH_2PO_4, Na_2HPO_4, or Na_3PO_4. Disodium phosphate is used as a reagent in the laboratory, and as a medicine.

When orthophosphoric acid is exposed to a sufficiently high temperature it loses water and forms pyrophosphoric acid, $H_4P_2O_7$.

$$2H_3PO_4 - H_2O = H_4P_2O_7.$$

The salts corresponding to this acid are termed pyrophosphates, as $Na_4P_2O_7$, etc.

If pyrophosphoric acid be heated to a red heat, it loses still more water and becomes metaphosphoric acid.

$$H_4P_2O_7 - H_2O = 2HPO_3.$$

Metaphosphoric is commonly known as glacial phosphoric acid, and is seen in the form of a colorless, crystalline mass. In watery solution it is slowly reconverted into the ortho acid, more rapidly by boiling. It is distinguished from the ortho and pyro acids by its property of precipitating albumin from solution.

Hypophosphorous Acid, H_3PO_2, has no corresponding oxid. It is formed by decomposing a hypophosphite by means of a stronger acid.

$$Ba(H_2PO_2)_2 + H_2SO_4 = BaSO_4 + 2H_3PO_2.$$

The acid is monobasic, i. e., only one hydrogen atom can be replaced by a metal, as in NaH_2PO_2, $Ca(H_2PO_2)_2$, etc.

Hypophosphorous acid and its salts are powerful reducing agents, precipitating gold, mercury and silver from their salts, and decolorizing solutions of the permanganates.

The hypophosphites are formed by generating phosphin in the presence of an alkali. When heated in air or in the presence of oxygen they take fire and burn, or may even decompose explosively, the phosphorus being oxidized to the pentoxid.

$$2NaH_2PO_2 + 4O = Na_2O + P_2O_5 + 2H_2O.$$

PRACTICAL STUDIES.

The water in which stick phosphorus has been kept usually contains phosphorous acid in solution. Test its powers as a reducing agent by the following experiments:

1. Add some of the liquid to a solution of mercuric chlorid, and warm. A white precipitate is mercurous chlorid.
2. Add another portion to some silver nitrate, and warm. A white precipitate is at first produced, gradually darkening and depositing metallic silver.
3. Place a small portion of a dry hypophosphite on a platinum foil, or a small piece of tin, and heat in the flame of a bunsen burner or alcohol lamp. What takes place?
4. Dissolve some of the hypophosphite in water, acidulate with hydrochloric acid, and add some dilute potassium permanganate. What color change occurs?
5. Add some solution of sodium phosphate to a solution of silver nitrate, and observe the color of the precipitate. Balance the equation:

$$Na_3PO_4 + AgNO_3 = Ag_3PO_4 + NaNO_3.$$

LECTURE No. 28.

Pharmaceutical Physics.

Electrokinetics.

Dynamic or Current Electricity.—When the attraction between the ends of the discharging conductors of the Töpler-Holtz machine becomes sufficiently great to overcome the resistance of the intervening air a discharge takes place and a spark passes between the electrodes. This transmission of electricity from one point to another constitutes an *electric current*, and properly directed can be made to do work. The spark which accompanies the discharge consists of the highly heated air particles, and probably also of volatilized portions of the electrodes.

The currents produced by machines of this class have only a limited range of usefulness, and are not adapted to the most common of the uses of electricity. For general purposes electric currents may be developed by chemical reaction, by thermal means, or by electro-magnetic induction, the last being the most important method.

The Voltaic Cell.—When a strip of zinc is placed in a vessel of water acidulated with sulfuric acid, bubbles of hydrogen are evolved and the zinc dissolves. If the zinc be removed and *amalgamated*, or coated with mercury, and replaced in the acid water, it is neither dissolved nor is hydrogen liberated. If now a strip of copper is introduced into the liquid, but without touching the zinc, and the two metals are joined at their tops by a wire, the zinc begins to dissolve, but liberates no hydrogen, while the copper liberates hydrogen, but does not dissolve. If the wire is cut in two, the evolution of hydrogen and dissolving of the zinc ceases, and begins again only when the two ends of the wire are joined. Cutting the wire, or breaking the connection between the zinc and copper in any other way, is known as *opening* or *breaking* the circuit. Joining the broken connection in any way is known as *making* or *closing* the circuit.

If the wire is examined while connecting the plates it is found to be possessed of new properties. Held near to a compass needle the latter is deflected from its north and south direction. If the two ends of the wire are separated in the dark a tiny spark may be seen at the moment of breaking the circuit. If the two ends of the wire are held on opposite sides of the tongue, a peculiar tingling sensation is noticed and a metallic taste perceived. From these and kindred phenomena we learn that there is a current of electricity passing when the circuit is closed, and ceasing when the circuit is broken.

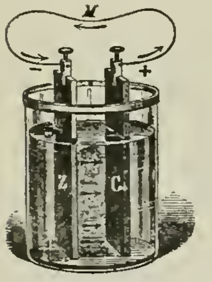

Fig. 89.—Simple Voltaic Cell.

Such an arrangement for the production of an electric current is known as a *voltaic* or *galvanic cell*. (Fig. 89.) Two or more such cells so connected that the current produced by one is increased or assisted by another constitute a *battery*.

Essentials of a Voltaic Cell.—The cell just described constitutes a type of all cells used in the production of voltaic electricity, consisting of two dissimilar plates immersed in a conducting liquid. The liquid must be an *electrolyte*, i. e., must be capable of transmitting an electric current. The plates must be *dissimilar*, or acted upon by the electrolyte at a different rate. In the cell described above, the electrolyte is diluted sulfuric acid, and the dissimilar plates are copper and zinc, one of which is dissolved by the electrolyte while the other is unaffected.

The greater the difference in the rate at which the electrolyte acts upon the two plates, the greater will be their *difference of potential*, and consequently the more efficient the cell as a current producer. The free ends of the wires used to connect the plates are known as poles or electrodes.

If we test the electrodes with a sufficiently delicate electroscope we shall find the one connected with the copper strip to be charged with + E and the other with — E. As the flow of current is from higher to lower potential we must assume therefore that outside of the cell the current passes from the copper to the zinc, but inside the cell from the zinc to the copper. It follows therefore that the zinc plate must be positive and the copper negative, or that *the positive plate is connected with the negative electrode, and the negative plate with the positive electrode.*

Different Kinds of Cells.—In the case of the cell already described the released hydrogen gradually accumulates over the surface of the copper, preventing access of the electrolyte and consequently weakening the production of current. This effect is known as "*polarization*" and may be prevented by mechanically agitating the battery liquid, or by oxidizing the hydrogen as fast as released, to form water. The latter is the method generally employed, as seen in the types of cells next to receive consideration.

The Gravity Cell.—This cell derives its name from the fact that it contains two fluids which are separated from each other by their difference in gravity.

In the common form of gravity cell the copper plate is placed at the bottom of the jar, and the zinc at the top. Crystals of copper sulfate are then placed in the bottom, and enough water added to cover the zinc plate. (Fig. 90.)

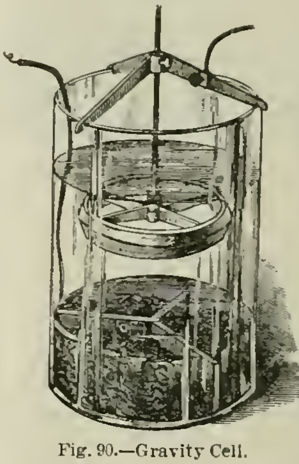

Fig. 90.—Gravity Cell.

When the cell is in action, the hydrogen which is released, instead of depositing upon the copper plate, attacks the copper sulfate, displacing the metal and combining with the radical SO_4 to form sulfuric acid. The displaced copper is deposited upon the copper plate, which thus slowly increases in bulk. The free sulfuric acid formed diffuses through the liquid and dissolves the zinc plate, this reaction being the source of the energy developed by the battery.

In order to keep the cell in good working order it is necessary to draw off the solution of zinc sulfate from time to time and replace it with water, and also to keep the bottom supplied with crystals of copper sulfate.

The gravity cell, because of its cheapness, continuous action and slight expense of maintenance, is the one generally employed upon telegraph lines, and similar circuits.

The Daniell Cell.—The Daniell cell resembles the gravity cell in that the released hydrogen decomposes a solution of cupric sulfate, forming sulfuric acid and depositing metallic copper. It is unlike the gravity cell in that the zinc is immersed in dilute sulfuric acid contained in a porous cup, while the strength of the cupric sulfate solution is kept up by means of a supply of crystals in a sort of cage attached to the negative plate.

The Grenet Cell.—In this cell the depolarizing fluid consists of a solution of potassium dichromate acidulated with sulfuric acid, with a movable plate of zinc between two carbon plates. (Fig. 91.) The released hydrogen reacts upon the chromic acid present, reducing it to a lower state of oxidation, while the excess of sulfuric acid combines with the zinc and the reduced chromic base.

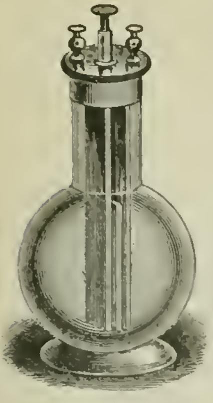
Fig. 91.—The Grenet Cell.

This cell gives a strong current at first, but gradually runs down when long in action, owing to the exhaustion of the liquid immediately in contact with the plates. This may be remedied by agitation or by standing until diffusion has restored the uniformity of the liquid next the plates.

An advantage of this cell is that when not in use the zinc plate may be lifted out of the cell and prevented from wasting.

The Bunsen Cell.—This is a type of the two-fluid cell, or those in which there is a separation of the liquid which consumes the zinc from the liquid whose office it is to oxidize the released hydrogen. In this cell the negative plate, a rod of gas carbon, is placed in an inner porous jar of unglazed porcelain containing nitric acid. The zinc plate, in the form of an open cylinder, surrounds the porcelain jar and is immersed in dilute sulfuric acid. (Fig. 92.) The purpose of the nitric acid is to oxidize the hydrogen, but in so doing it is itself reduced to the lower oxids of nitrogen which are both offensive and corrosive. The Grove cell differs from the Bunsen chiefly in having the negative plate of platinum instead of carbon.

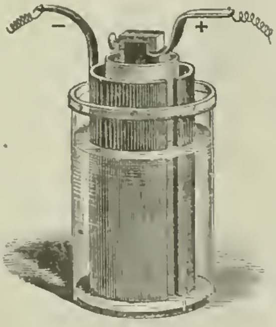

Fig. 92.—Bunsen Cell.

Both cells give strong and constant currents, but in addition to the disagreeable fumes which they evolve are subject to the defect of the gradual penetration of the porous cup by the nitric acid, and its destructive action on the zinc.

The Leclanche Cell.—In this pattern of cell the negative plate is surrounded by a *solid depolarizer*. The carbon plate is contained in a porous cup and packed in a mixture of fragments of coke and manganese dioxid, the latter compound oxidizing the hydrogen at the moment of its release. The positive plate consists of a rod of zinc immersed in a solution of ammonium chlorid contained in the outer jar. (Fig. 93.)

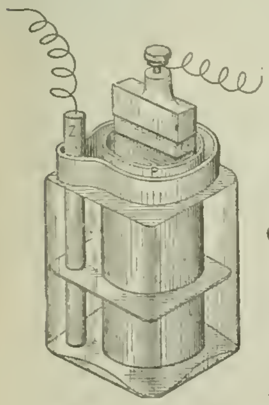

Fig. 93.—Leclanche Cell.

The defect of this type of cell is that the oxidizing compound works slowly, and needs periodical rest to recover its powers. On this account the cell is only adapted to *open circuit* work, where the circuit is only closed for a short period of time, as in telephone and bell circuits.

While many other forms of cells are made and used, the foregoing represent the principal types, and are such as are of greatest usefulness in the electrochemical operations likely to be of interest to the pharmaceutical chemist.

PROPERTIES OF THE ELECTRIC CURRENT.

Physiological Effects.—When the electrodes of a battery yielding a sufficiently powerful current are taken in the hands a peculiar physiological effect denominated a "shock" is experienced. By modifying the strength and character of the current the physiological effect can be made to render valuable service as a therapeutic agent, or may be so severe as to occasion the death of the person.

Heating and Luminous Effects.—When a current is passed through a conductor its temperature is raised, and if the resistance be great enough it may become luminous, or even fused. An example is seen in the common incandescent lamp in which a narrow filament of carbon is raised to incandescence by the passage of the current.

Chemical Effects.—The electric current is capable of causing a variety of chemical changes, both of combination and of decomposition. For example, if the current be passed through water, acidulated with sulfuric acid, the water is decomposed, the hydrogen appearing at the negative and the oxygen at the positive electrode. Such a decomposition is known as *electrolysis*, and the liquid decomposed as an *electrolyte*.

The electrode through which the current enters the electrolyte is known as the *anode*, and that through which it leaves as the *cathode*. The elements into which the electrolyte is decomposed are known as the *ions*. The ion set free at the anode is the *anion*, and that released at the cathode the *cathion*.

Hydrogen and the metals are always released at or deposited upon the cathode, and since this is the negative electrode the metals are called *electro-positive* elements. Non-metals and acid radicals are released at the anion or positive electrode, and are therefore *electro-negative*.

The process of electrolysis is much used at the present time for the reduction of certain metals from their ores, as for example, in the production of aluminum.

Magnetic Effects.—If a copper wire through which an electric current is passing be dipped into iron filings the latter will cling to the wire in the same manner as to a magnet. If the wire is passed vertically through a piece of cardboard and filings are sprinkled over the latter they will arrange themselves in circular lines around the wire. If a magnetic needle be held over the cardboard it will place itself tangent to the circular rows of filings, showing that the wire is surrounded by a field of force like a magnet. (Fig. 94.)

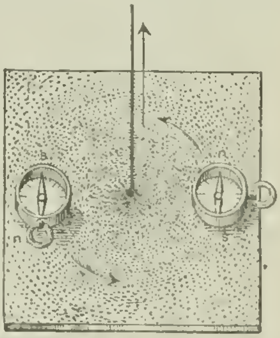
Fig. 94.—Effect on Current on Iron Filings.

If a wire be wound in spiral form around a rod of soft iron, the rod will exhibit all the properties of a magnet during the passage of the current through the wire. (Fig. 95.) If the soft iron be replaced by a rod of steel, the latter will remain a permanent magnet after the current ceases.

When a current-bearing wire is held near to a magnetized needle the latter is deflected and endeavors to place itself at right angles to the direction of the current.

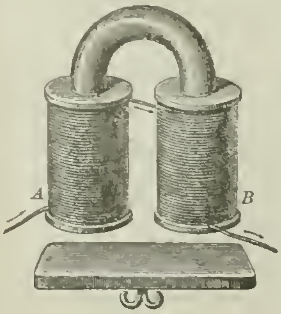

Fig. 95.—Electro-Magnet and Armature.

Measurement of Current.—The application of electricity to practical purposes renders necessary some means of measuring the current. Almost any of the effects of electricity just described might be made use of for this purpose. For example, the current might be made to heat the ice or water of a calorimeter and the amount of electricity estimated from the heat evolved, or to electrolyze a salt and the electricity calculated from the weight of metal deposited. Again, it may be caused to decompose acidulated water and the evolved gases measured, or lastly it may be made to deflect a magnetic needle, and the amount of deflection noted. All of these methods have been utilized, but for our present purpose it will be sufficient to consider only two, the *voltameter* and the *galvanometer*.

The Tangent Galvanometer.—When the deflection of a magnetic needle is used merely to detect the existence of an electric current the arrangement constitutes a *galvanoscope*. Properly constructed the instrument may be employed to determine the *strength of the current*, and is then known as a *galvanometer*. The use of the galvanometer for this purpose depends upon the principle that the *strength of current is proportional to the tangent of the angle of deflection*.

The tangent galvanometer in its simplest form consists of a very delicate magnetic needle suspended in the center of two coils of fine insulated wire, each coil consisting of many turns. (Fig. 96.) The diameter of the coil should be large in comparison with the length of the needle.

When a current passes through the coils, the needle is deflected, the direction of the deflection depending upon the direction of the current, and the amount of deflection upon the strength of the current.

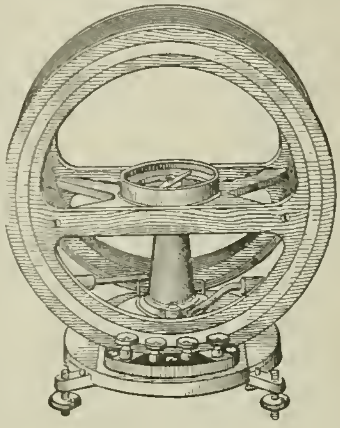
Fig. 96.—Tangent Galvanometer.

The Voltameter.—A simple form of voltameter consists of a glass jar through the bottom of which pass two wires connected with flat pieces of platinum to serve as electrodes. Water acidulated with sulfuric acid is poured into the jar until the electrodes are covered, and a graduated tube, also filled with water inverted over the electrodes. (Fig. 97.)

When the current passes, the water is decomposed into oxygen and hydrogen, and the mixed gases rise into the tube and displace the water. By noting the volume of gas produced in a given time the strength of current may be estimated.

The voltameter is especially useful in determining the strength of current in electro-chemical analyses.

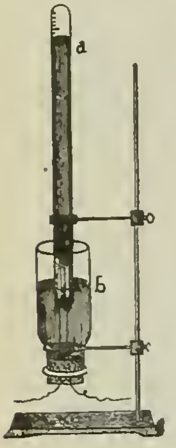

Fig. 97.—Simple Voltameter.

UNITS EMPLOYED IN ELECTRICAL MEASUREMENT.

The Volt.—As the strength of a current of water is indicated by the quantity of water which flows through a pipe in a given time, so the strength of an electric current is measured by the quantity of electricity that passes through a conductor in a stated unit of time.

It is found by experiment that the strength of an electrical current depends upon the kind of battery used and upon the resistance of the circuit through which it flows.

The power of a cell to set electricity in motion or to develop a current is known as its *electro-motive force* (abbreviated E. M. F.), and varies with the kind of cell employed. For example, a Bunsen cell in good working order would in a circuit of given resistance be able to set in motion about twice the quantity of electricity that a gravity cell would, and has therefore about twice the electro-motive force of the latter.

This power to maintain a current in motion depends entirely upon the nature and condition of the materials employed in the construction of the battery, and is independent of the size of the cell, or of the distance apart of the plates. The unit of electro-motive force is the *volt*, which is nearly equal to the electro-motive force of one Daniell cell in good working order. Measurement of electro-motive force, then, is measurement of the "electrical pressure" of a cell, or of the difference of potential between its two plates.

Every conductor offers some degree of opposition to the passage of a current through it. This opposition is known as *resistance*. Resistance varies with the character of the material of which the conductor is made, with its length, and with the area of its cross section.

If it were not for resistance, the current in a circuit would be equal to the current which the battery would be able to develop, or it would be equal to teh electromotive force.

The law which expresses the relation of current strength to the resistance of a circuit is known as Ohm's Law, which is that *the strength of current is equal to the electromotive force of the battery divided by the resistance of the circuit*. Letting C represent the current, R the resistance, and E the electro-motive force, the law may be expressed by the formula: $C = \frac{E}{R}$ But the battery also has resistance of its own, or "internal resistance." Representing the latter by r the complete expression becomes $C = \frac{E}{R + r}$.

Unit of Resistance. The Ohm.—In order that resistance may be expressed intelligently, it is necessary that some definite unit be selected, and for this there has been chosen the *Ohm*, which is equal to the amount of resistance at 0° C. of a column of mercury one millimeter in cross section and 106 cM. long.

Unit of Current Strength. The Ampere.—According to Ohm's Law the electro-motive force divided by the resistance of the circuit equals the current strength. The unit of current strength is the *Ampere*, which is the strength of current flowing through a circuit in which the electromotive force is one volt and the resistance one ohm, or

$$\frac{1 \text{ volt}}{1 \text{ ohm}} = 1 \text{ ampere.}$$

If a current of one ampere continues to flow for one second, a certain definite quantity of electricity will have passed which is known as the *coulomb*, or a coulomb is the quantity of electricity which passes in one second when the current strength is one ampere.

Other units are in use by electricians, but need not be considered here.

Batteries.—Two or more cells connected so that the current moves in the same direction through each constitute an electric battery. Two methods of combining the cells are in common use. When the internal resistance of the battery is small compared with the resistance of the external circuit, the cells are *connected in series*, or the positive electrode of one cell is coupled with the negative plate of the next, and so on for all of the cells. By connecting the cells in series the E. M. F. of one cell is added to the E. M. F. of the next, and so on throughout the circuit.

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When the resistance of the external circuit is small compared with the internal resistance, the cells may be coupled *abreast* or in *multiple arc*. By this method the positive plates are all connected together, and all the negative plates together, so that the result is the same as if one cell were used with a positive plate equal to all the positive plates combined, and a negative plate equal to all the negative plates combined. The internal resistance is thus lowered, but the E. M. F. is not increased. Sometimes it may be of advantage to combine the two methods, or to couple part of the cells abreast, and then connect these combinations in series.

THERMAL GENERATION OF CURRENT.

If two dissimilar bars of metal, as copper and german silver, are united and their point of junction heated by a gas jet, an electric current is developed in the bars, as may be shown by the deflection of the needle of a galvanometer with which the free ends of the bars are connected. The needle will also be deflected, but in the opposite direction, if the junction is suddenly cooled by a cake of ice.

These results show that heat may be transformed directly into electricity, and that the current produced by the withdrawal of heat is in the opposite direction to the current produced by the application of heat.

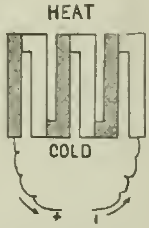

Fig. 98.—Thermo-Electric Battery.

Any two metals combined as described for the production of an electric current by means of heat are known as a *thermo-electric pair*. A combination of such pairs constitutes a *thermo-electric battery*. (Fig. 98.)

The strength of current developed by a thermo-electric pair depends upon the character of the elements joined, some metals giving a much greater E. M. F. than others. The strongest current is that produced by a pair consisting of a bar of bismuth combined with one of antimony.

The current also depends upon the difference of temperature between the two ends. The greater the difference in temperature the stronger the current.

The electro-motive force of a thermo-electric battery is very small, and besides, less than one per cent. of the heat energy employed is converted into current. On this account, and because of their costliness, and the ease with which they are put out of adjustment, such batteries have a very limited field of usefulness as producers of the electric current. Perhaps the greatest use of thermo-electric currents is in the measurement of difference of temperature by means of the *thermopile*. (Fig. 99.) This consists of a delicate thermo-electric battery made up of a number of pairs and connected with a sensitive galvanometer. Very slight differences in the temperature of the two ends of the pile will serve to produce a perceptible deflection of the needle. In this way changes may be detected which are entirely too minute for the ordinary thermometer.

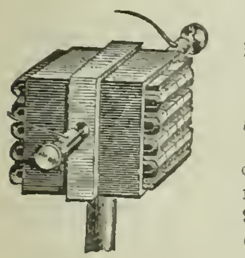

Fig. 99.—Thermopile.

FLUID FOR PRESERVING SPECIMENS.—Amphibia, fishes, reptiles, medical-anatomical preparations, botanical objects, etc., can be preserved so as to retain their natural appearance for years by keeping them in the following fluid: Glycerin, 100 parts; corrosive sublimate, 0.5 part; thymol, .01 part. Colorless petroleum may be substituted for glycerin and in such a case the sublimate may be omitted. The latter is needed, even with the glycerin, only for easily decaying objects. (Ph. Post.)

EARLY AMERICAN CHEMICAL SOCIETIES.*

By PROF. H. CARRINGTON BOLTON, PH. D.

Three chemical societies were organized in the United States before the close of the first quarter of this century: 1. The Chemical Society of Philadelphia, founded in 1792. 2. The Columbian Chemical Society of Philadelphia, founded in 1811. 3. The Delaware Chemical and Geological Society, founded in 1821. These societies were short-lived, local in jurisdiction, and without much influence on the progress of science; but it is interesting to note that professional teaching, and amateur chemists in America formed associations for mutual improvement and for the advancement of their calling forty-nine years earlier than their brethren in England. American chemists were not impelled to form independent societies owing to a lack of organizations for men of science, but they early felt the advantages of specialization. Both the society of 1792 and that of 1811 were formed in a city honored by the presence of the venerable and dignified American Philosophical Society, established by Benjamin Franklin in 1743.

1. The Chemical Society of Philadelphia was undoubtedly the earliest organized body of chemists in either hemisphere; it does not appear to have published records of its meetings, but in 1801-2 it was presided over by Dr. James Woodhouse, the vice-presidents being Felix Pascalis and John Redman. Dr. Woodhouse (1770-1809) was at the time Professor of Chemistry in the medical department of the University of Pennsylvania, of which he was a graduate. This chair had been held by Dr. James Hutchinson, and on his death, in 1793, Dr Joseph Priestley, who arrived from England a few months later, was invited to succeed him, but he declined, preferring retirement at Northumberland, and Dr. Woodhouse was chosen instead. He was more of a physician than a chemist, and most of his writings were on medical topics, but he edited Chaptal's Elements of Chemistry and other works. He is said to have been the first to prove by comparative experiments the superiority of anthracite coal from Pennsylvania over bituminous coal from Virginia for intensity and regularity of heating power.

The first vice-president, Felix Pascalis-Ouvriere (1750-1840), had an interesting career. He was born in France, where he received his medical education, but emigrated to Santo Domingo, and while practicing his profession there acquired an extensive knowledge of botany and other branches of natural history. In 1793 a revolt among the negroes compelled Pascalis to take refuge in the United States: he settled first in Philadelphia and afterward in New York, where he aided in founding the Linnæan Society of New York. The second vice-president, Dr. John Redman (1722-1808) was one of the foremost practitioners of medicine in Philadelphia, and from 1786 was President of the Philadelphia College of Physicians.

Among the most active members of the Philadelphia Chemical Society were Priestley, Hare and Seybert. The ambition of the members is shown by the circumstance that a standing committee in 1802 was prepared to analyze every mineral production sent to them, free of expense. The meeting held Oct. 25, 1801, was made memorable by the appointment of a committee for the "discovery of means by which a greater concentration of heat might be obtained for chemical purposes." One of the committee, Robert Hare, then only twenty years of age, reported to the society on Dec. 10 his invention of the "hydrostatic blowpipe." Hare's remarkable paper was printed in a small pamphlet of thirty-four pages with the title, "Memoir on the Supply and Application of the Blowpipe, containing an account of a new method of supplying the blowpipe either with common air or oxygen gas." Hare's invention yielded a fruitful harvest of discoveries and alone justified the existence of the first of chemical societies; his subsequent career as Professor of Chemistry in the medical school of the University of Pennsylvania from 1818 to 1847 is well known.

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*Abstract of a paper read to the Washington Chemical Society, April 8, 1897, in Popular Science Monthly.

2. The Columbian Chemical Society of Philadelphia was founded in the month of August, 1811, by a "number of persons desirous of cultivating chemical science and promoting the state of philosophical inquiry."

The principal officers elected at the first meeting were as follows: Patron, Hon. Thomas Jefferson, Esq.; president, Prof. James Cutbush; vice-presidents, George F. Lehman, Franklin Bache.

Thomas Jefferson's commanding position in the world of science and arts, as well as his literary attainments, well qualified him for the office of patron; he was at that time living at his country seat in Virginia, having already served his country for eight years as chief magistrate.

The president of the society, Dr. James Cutbush, was Professor of Natural Philosophy, Chemistry, and Mineralogy at St. John's College; in 1814 he held the position of assistant-apothecary-general in the army, and he afterward became Professor of Chemistry and Mineralogy at the United States Military Academy, West Point, where he died in 1823. Dr. Cutbush published several books, the best known being A System of Pyrotechny (Philadelphia, 1825), an elaborate work of 600 pages.

Franklin Bache, the second vice-president, was at that date a youth of only twenty years, who had graduated the year before at the University of Pennsylvania. He was a grandson of Benjamin Franklin and a member of the distinguished Bache family which numbered so many eminent men of science. He afterward became Professor of Chemistry at the Jefferson Medical College, a position which he held until his death in 1864.

The constitution adopted by the founders of the society, besides the usual business rules, contained some unusual features. The officers included an orator, whose duty it was to deliver an oration on some chemical subject once every year. Since the Society's Memoirs contain no "oration," it is to be feared that the incumbent's efforts were not satisfactory. The constitution undertook to control the members' actions by a series of fines: 12½ cents for absence each roll, and $1 for refusing to accept an office or declining to read an original chemical essay when appointed to do so. To insure against members withdrawing early from a dull meeting, the secretary was directed to call the roll at the opening and close of each meeting, and to fine absentees 12½ cents. Candidates for membership were required to read an original essay on some chemical subject to be discussed by the members, and a two-thirds vote was required to insure election. It seems to have been easier to be put out of the society than to get into it, for "any member behaving in a disorderly manner shall be expelled by consent of two-thirds of the members present."

There were two classes of members: "Junior," thirteen in number, and "honorary," sixty-nine in number, of which thirty-one were Europeans; the home list included most of those chemists whose labors contributed largely to the foundations of the science in the New World. Brief notices of the prominent ones are here given:

Dr. Benjamin Smith Barton (1766-1815), who has been called by his admirers "the father of American natural history," held the chair of medicine, natural history, and botany in the University of Pennsylvania; he was an agreeable writer on natural history topics.

Dr. Archibald Bruce (1777-1818) was one of the pioneers of mineralogical science in America, and published one volume of the American Mineralogical Journal in 1810; he held the chair of mineralogy in Columbia College, New York.

Thomas Cooper (1759-1840), born in London, accompanied his friend Priestley to America in 1793, sharing his radical views in politics and religion. He held the chair of chemistry at the college in Columbia, S. C., of which he afterwards became president.

Dr Edward Cutbush (1772-1843) was surgeon in the United States Navy and Professor of Chemistry in the medical school of the Columbian University from 1825 to 1827.

Dr. John Griscom and Dr. David Hosack were both citizens of New York; the former had the honor of being regarded as the head of all teachers of chemistry in New York for thirty years; the latter was Professor of Botany and Materia Medica in Columbia College, but is best known as the founder of the first public botanic garden in the United States in 1801. He died under tragic circumstances—of shock at the disastrous conflagration in New York city, which swept away his property to the value of $300,000.

Dr. John Maclean (1771-1840) was the first Professor of Chemistry in the College of New Jersey, now Princeton University, to which chair he was elected in 1797.

The Hon. Samuel L. Mitchill, M. D., F. R. S. E. (1764-1831), was not only an active Professor of Chemistry and Natural History in Columbia College, New York, and editor of the New York Medical Repository, but he was Senator of the United States from 1804.

Dr. Benjamin Rush (1745-1813) was undoubtedly the first professor of chemistry in America, his appointment dating Aug. 1, 1769. In his busy life he was Professor of the Institutes and Practice of Medicine in the University of Pennsylvania, besides acting as Surgeon General of the United States Army, Treasurer of the Mint, President of the Society for the Abolition of Slavery, and Vice-President of the Bible Society of Philadelphia, in which city he also conducted a large medical practice.

Dr. Adam Seybert (died 1825) was a pioneer in air analysis, having made twenty-seven analyses of the air by eudiometric methods on a voyage across the Atlantic in 1797. He came to the conclusion that the sea exerted purifying power over the air.

Benjamin Silliman, at the time of the founding of the Columbian Chemical Society, was forty years of age and had held the chair of chemistry in Yale College for ten years. The American Journal of Science was not begun until 1818. Silliman's name is a household word among us, and no eulogium is here needed to magnify his position in the scientific world.

The prominence of medical men on the roll of members is evident and readily explained. Before the days of schools of science, and before colleges devoted a portion of their curricula to scientific studies, almost the only training in science received by American youth was in the medical schools. The chairs of natural history and of the physical sciences were almost exclusively held by physicians whose education more nearly qualified them for teaching these branches of knowledge than the graduates of the classical courses customary in all colleges. To elevate the standard of membership in the Columbian Chemical Society a number of distinguished foreigners were enrolled. These included such men as Berthollet, Gay-Lussac, John Dalton, Sir Humphry Davy, and Dr. Wollaston, but no representatives of Germany or Sweden, which presumably indicates that at this early date communication and exchange of courtesies with Germany and Northern Europe were less common than with France and England.

The society issued in 1813 one volume of Memoirs, containing twenty-six essays by ten writers on a great variety of topics—original, speculative, and practical. Eight of these papers are from the pen of Dr. Thomas D. Mitchell. In his remarks on the Phlogistic and Antiphlogistic Systems of Chemistry he supports the Lavoisierian theory of combustion, stating that there is "no necessity for a principal of inflammability." He cites the experiment of Woodhouse, who obtained an inflammable air by heating charcoal with scales of iron, both being free from water; and points out that Cruikshank, of Woolwich, demonstrated that the inflammable gas thus obtained is gaseous oxide of carbon (carbon monoxide), discovered by Priestley in 1799 and combustible, although containing no hydrogen. He compares combustion with neutralization of an acid and base, and says "Inflammation and acidity are effects resulting from the action of relative causes and not attributable to a single agent or principle."

Dr. Mitchell, in his paper, Remarks on Heat, objects to the term "latent heat" and to Dr. Black's theories. In a paper entitled On Muriatic and Oxymuriatic Acids he attacks the views of Sir Humphrey Davy as to the nonexistence of oxygen in muriatic acid, clinging to the statement of Lavoisier that all acids contain oxygen, and he claims that combustion is accompanied by decomposition of oxygen gas. The doctor's Analysis of Malachite from Perkioming, Pa., is given as follows: One hundred and twenty grains of the green carbonate contained carbonic acid, thirty grains; quartz and siliceous earth, sixty-eight grains; brown oxide of copper, fifteen grains; loss, seven grains. The specimen was evidently a poor one. No account was taken of the water, and reporting results in percentages does not seem to have been in vogue.

The same writer, in Remarks on Putrefaction, discusses the action of antiseptics and attributes the virtues of nitrate of potash to the increase of cold produced by the muriate of soda. His other papers are argumentative and speculative, with little originality.

Franklin Bache's three papers are likewise speculative disquisitions. In one he points to the "great error" in which Berthollet fell as respects the law of chemical affinity, and in another he proposes to introduce the following improvements in nomenclature: Nitral acid forming nitrotes; nitril acid forming nitrutes; nitrous acid forming nitrites, and nitric acid forming nitrates.

Four of the papers in the Memoirs are by Dr. John Manners. His Experiments and Observations on the Effect of Light on Vegetables abounds in quotations from Darwin's Botanic Garden. In the Mineral Spring at Willow Grove, fourteen miles from Philadelphia, he found iron and sulphureted hydrogen. In Experiments and Observations on Putrefaction he tested the influence of carbonic acid, hydrogen, and other gases on putrefying flesh, and he attempted to collect and analyze the gases generated by the same. He concludes that "putrefaction depends on a destruction of the equilibrium of attractions which exists in the elementary principles of which the animal substance is composed in a healthy state, occasioned by the loss of vitality in consequence of which new compositions and decompositions ensue."

of which new compositions and decompositions ensue."

The president of the society, Prof. Cutbush, describes quite clearly the "oxyacetite of iron" as a test for the detection of arsenic, a process since used quantitatively by Kotschoubey.

Speculations on Lime, by Dr. Joel B. Sutherland, contains the singular claim that if mortar be made with sand containing common salt the resultant compound gives "so much coldness to the mass that during the whole summer vapor is almost incessantly precipitated on a wall" with which it is plastered.

Mr. Edward Brux, one of the junior members, writes Upon the Effects of Various Gases upon the Living Animal Body, which consists largely of speculations, notwithstanding which he cites an admirable passage from Dr. Bostock: "Physiologists have in general been more inclined to form hypotheses than to execute experiments, and it has necessarily ensued from this unfortunate propensity that their science has advanced more slowly than perhaps any other department of natural philosophy." Unfortunately, this truth was not fully recognized by the members of the Columbian Chemical Society.

A contemporary journal (New York Medical Repository) reviews the Memoirs in the following quaint style: "It is highly gratifying to behold a band of worthies like those before us laboring to analyze the compounds which they find ready made, to form by synthesis new combinations in the laboratory, and thereby to deduce correct doctrines from the facts which are disclosed. We cordially congratulate them on their noble occupation and on the progress they have made. We hope they will be persevering and undaunted; and if from this beginning there shall arise great improvements in theoretical disquisition, as well as in economical exercise, we shall rejoice with a mingled glow of amicable and patriotic sentiment."

3. The Delaware Chemical and Geological Society was organized at Delhi, Delaware County, New York State, Sept. 6, 1821. The first meeting was held at the hotel of G. H. Edgerton, in the village. The president was Charles A. Foote, and the vice-president the Rev. James P. F. Clark. The society was composed of between forty and fifty well-informed and respectable inhabitants of the county. It had for its object the improvement of the members in literature and science, especially in mineralogy and chemistry. The members planned to form a library, and they made a collection of the minerals and rocks of the region, but the society was not long sustained.

In reviewing the condition of chemical science in the United States as indicated by the membership and achievements of these early societies, we note that those who held the most prominent places were handicapped by the necessity of devoting a large part of their intellectual energy to topics quite outside of the domain of chemistry itself. The active members were either busy with the art of healing or with teaching several branches of the physical and natural sciences, and too often chemistry was regarded in the colleges as a kind of side issue or appendix to the more important subjects of instruction. This was caused by the necessity of earning a competence at a time when there was no opportunity of reaping pecuniary rewards by skill as an analyst or by the application of science to the manufacture of products involving chemical knowledge. Indeed, in default of this stimulus to laboratory work it is not surprising that the papers read to the societies were largely either reviews of the grand discoveries made by Europeans or essays in which the imaginative faculty was given free play, it being far easier to indulge in speculations than to discover new facts.

In the early struggles of a country to secure a place among nations few men of ability can devote their energies to the pursuit of science for science's sake. The environment is more favorable to development of the inventive faculty than of the peculiar talent for conducting abstruse researches in an exact science. Add to this the limited facilities for acquiring chemical knowledge in the New World and the distance of amateurs from the European head centers of learning, and it is certainly noteworthy that American chemists combined to form associations for mutual improvement and the advancement of their calling at so early a period.

A fourth attempt to establish a chemical society was made at New York City in 1876. The organization was at first somewhat restricted in its plan, but in 1892 a change in its constitution was affected which broadened its scope, and it now forms a strong, influential, and truly national society. Its nine hundred and eighty-four members, working in nine chartered sections, represent forty-seven States and Territories, besides several countries of Europe, South America, and distant Australia. Its Journal, comprising eleven hundred and fifty pages annually, is an authoritative medium for the preservation and diffusion of the researches made in the United States, and its annual meetings, held in diverse localities, strengthen the bonds which unite its members in good-fellowship and in the pursuit of their common profession.

PHARMACY.

"MUSTARD DROSS" is the hull or refuse after mustard seed has been pressed, pounded and sifted. It is used for mustard and spice preparations.

NEUTRALINE is a colorless liquid possessing the appearance and qualities of a highly refined oil and it is produced by distillation from paraffin, ozokerite, or from some mineral substance. It is a distilled oil.

GERMOL is a fluid composed of dead oil, rosin, (both known as distilled oils), combined with some alkali, and forming a saponaceous chemical compound soluble in water. It is used as a germicide and disinfectant.

NUTROSE.—A new nutritive preparation, cheaper than the other similar albumen substitutes, is stated to be a combination of casein from cow's milk with sodium salts. It is easily digested and unirritating, and contains all albuminous substances present in meats.—(Ph. Post.)

INCOMPATIBILITY OF FLUID EXTRACTS OF WITCH HAZEL AND HYDRASTIS.—A mixture of 1 part of the former to 2 parts of the latter gives rise to an abundant precipitate. This reaction is thought to be due to the tannin of the witch hazel and the resins, volatile oil, etc., in the hydrastis.—(Bull. Comm. de Phar.)

PHENOCOLL IN MALARIA.—On the west coast of Africa hydrochloride of phenocoll has been found successful in controlling obstinate cases of malaria when quinine has failed. The dose used is about six grains three times a day, from which no unpleasant symptoms have been observed.—American Practitioner and News.

ANESIN.—The tertiary trichlorbutyl alcohol, is formed by a transposition of the atoms in acetone-chloroform. It is a weak antiseptic and can serve as a substitute for cocaine in most cases. In doses of 0.5 gm. (8 grains) it is an effective hypnotic without bad after-effects, even when given in double or triple this quantity.—Ph. Wochensch.)

SAPOCARBOL is a strong solution of crude carbolic acid in soft soap. It has a honey-like consistence, is readily miscible with water, and makes a powerful disinfecting solution for closets, etc. For this purpose it is dissolved in ten times its weight of water. The well-known antiseptics creolin and lysol have a composition similar to sapocarbol.—(Seif. u. Oel. Fabrik., through Drog. Zt.)

FLUID FOR ETCHING GLASS. A good preparation for writing on glass is made as follows: Dissolve 18 gm. sodium fluoride and 3.5 gm. potassium sulphate in 250 cc. water. Also dissolve 7 gm. zinc chloride in 250 cc. water and add 32.5 gm. hydrochloric acid. For use mix equal parts of the solutions. The time required for etching is [illegible].—(Südd. Ap. Zt.)

ALMOND MEAL. 50 gm. dried sodium carbonate, 100 gm. powdered borax, 250 gm. powdered orrisroot, and 2 kg. best wheat or rice flour are mixed and thoroughly rubbed up with 120 gm. expressed oil of almond. To this 100 gm. storax and 50 drops oil of bitter-almond are added and the whole put through a moderately fine hair sieve.—(Südd. Ap. Zt.)

PRESERVATION OF ERGOT. A coating of tolu-balsam is asserted to increase the keeping qualities of ergot (Ph. Centralh.). According to Südd. Ap. Z., this is unnecessary, as well dried ergot will keep very well without it. It is recommended to keep it in a perforated tin box, and this placed in a wooden box having a layer of quicklime on the bottom. Ergot kept in this way is characterized by an almost entire lack of odor, which is regarded as an indication that no decomposition is taking place.

QUESTION BOX

The object of this department is to furnish our subscribers and their clerks with reliable and tried formulas and to discuss questions relating to practical pharmacy, prescription work, dispensing difficulties, etc.

Requests for information are not acknowledged by mail and ANONYMOUS COMMUNICATIONS RECEIVE NO ATTENTION; neither do we answer queries in this department from non-subscribers.

Easter Egg Dyes.

(S. H. G.) See this journal, Jan. 21, 1897, page 79. The details of the particular process you desire will have to be worked out by yourself.

Stains Made by Printers' Ink.

(C. A. B.) Stains made by printers' ink may be removed by scrubbing them with petroleum ether or benzine. If the stains are on a painted or varnished surface this treatment is likely to remove some of the paint or varnish, in which case the surface so affected must be repainted. Marble surfaces, after removal of the ink must be repolished.

Books on Photography.

(W. H. R.) The following books are recommended for those intending to take up the study of photography: Wall, "Every One's Guide to Photography," 50 cents; Adams, "Amateur Photography," 50 cents; Burbank, "Photographic Printing Methods," $1; Meldola, "The Chemistry of Photography," $2; Adams, "Photographic Instructor for the Professional and Amateur," $1; Burton, "Photographic Optics," $1.50; Robinson, "Picture Making in the Studio," 50 cents.

Red Ink for Numbering Machine.

(A. B. R.) Try the following:

Eosin, B B N	3 parts
Distilled water	10 parts
Alcohol	10 parts
Glycerin	70 parts

For self-inking machines, which are so arranged that the lower surface of the stamp is inked through a piece of cloth, the ink must be thinly fluid to permit it to penetrate the cloth with sufficient rapidity to allow of several impressions being taken in succession.—(Lehner.)

Pharmacy Laws of the U. S.

(J. E. J.) For a digest of the pharmacy laws of the United States, see this journal, March 12, 1896, page 325; March 19, 1896, page 356; and March 26, 1896, page 384. On pages 416, 448 and 480, in the same volume appear the various provisions of the poison and liquor laws in tabulated form. You will also do well to consult the annual volumes of the Proceedings of the American Pharmaceutical Association, in which are recorded the laws passed in each State during the period which the particular volume covers. There is no single publication which contains all the pharmacy laws in force at the present time.

Books on Embalming.

(P. J. B.) One of the best little works on this subject is "Embalming and Embalming Fluids," by Chas. W. McCurdy. Besides presenting the leading features of embalming it gives a very complete bibliography of the literature of the subject. The price is $1. Other works on the subject are Barnes and Barrum, "The Art and Science of Embalming: Descriptive and Operative;" Clarke "New Work on Embalming" (2d Ed., Indianapolis, 1896); Lewis, "The Embalmer's Guide," and Renouard, "The Undertaker's Manual." Instruction in embalming is offered by the U. S. School of Embalming, 23 University Place, this city.

The Era Course in Pharmacy

J. H. BEAL, Sc.D., Ph.G., Director.

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THE ERA COURSE IN PHARMACY is a thorough, practical and economical course of home study in pharmacy, and covers the subjects usually embraced in the curriculum in a standard college of pharmacy. It is designed for all who desire systematic instruction in pharmacy; for clerks who cannot attend college; for those preparing for pharmacy board examinations; as auxiliary course for students in college, and as a means of review for graduates and experienced pharmacists.

THE LECTURES are published weekly in THE PHARMACEUTICAL ERA, and the **QUIZZES** and **EXAMINATIONS** are conducted by mail. A separate question blank is issued on each lecture and sent to each matriculate, his answers are duly rated by the instructors and returned to the student with corrections and notations.

THE ENTIRE COURSE covers a period of two years and **DIPLOMAS** are issued to all passing final examinations. Each year is divided into two terms. The first term of the Junior year began September 2, 1897, and will end January 27, 1898; the second term will begin February 17, 1898, and end June 30, 1898. The junior class for 1897 is now closed.

FEES. The entire expense is only $7.75 per annum and includes subscription to the ERA, tuition fees and a binder for preserving copies and lectures.

LECTURE NO. 29.

Inorganic Chemistry.

Arsenic. Antimony.

ARSENIC.

Symbol As. Valence 3, 5. Atomic Weight 74.9. Specific Gravity 4.71 to 5.72.

Historical.—The native sulfids of arsenic, orpiment and realgar, have been known since very ancient times. The trioxid was known to Geber and the later alchemists who made use of it in their attempts at transmutation of the metals. Albertus Magnus seems to have been the first to describe a method of obtaining the element by the reduction of the trioxid with organic matter.

The English name is from the Latin *arsenicum*, derived from the Greek *arsenikon*.

Natural Occurrence.—The element occurs native in the crystalline form, or as kidney-shaped masses. It is found in combination with sulfur as orpiment, As_2S_3, or realgar, As_2S_2. It occurs in combination with iron, nickel, cobalt and other metals as arsenids, and is almost universally present in iron pyrites. It is present also in sea water, in numerous mineral waters, and in many other inorganic substances.

Preparation.—The element may be obtained by heating arsenical pyrites, and condensing the vaporized arsenic, or by heating any arsenous compound with carbon, as powdered charcoal. In the presence of air the vapor will combine with oxygen to form the trioxid.

Description and Physical Properties.—Elemental arsenic is steel gray, with a metallic luster, resembling white cast-iron in appearance. It exists in two allotropic modifications, one of which is amorphous and the other crystalline. The specific gravity of the amorphous variety is 4.71 and of the crystalline 5.76. It can be melted under pressure, but when heated without pressure volatilizes directly without liquefying. Its vapor has a lemon yellow color and a disagreeable, garlic-like odor. At a low red heat the density of the vapor indicates the presence of four atoms in the molecule, or As_4. As the temperature rises these molecules split up, and at a white heat the density corresponds to the molecule As_2.

Arsenic and all of its soluble combinations are powerful poisons, both to the animal and vegetable economy.

Chemical Properties.—Arsenic occupies the dividing line between the metals and non-metals. In its physical characteristics it approaches the metals very closely, having the luster of the latter and being a fairly good conductor of heat and electricity, while in nearly all of its chemical combinations it acts as a negative element or acid radical, and in this respect resembles the non-metals.

The element is tolerably permanent in dry air, but in moist air becomes covered with a coating of oxid. Heated on charcoal, compounds of arsenic are first reduced to the elemental state, the free element then combining with oxygen to form the trioxid which rises in the form of a white cloud.

COMPOUNDS OF ARSENIC.

Hydrogen Compounds.—Arsenic combines with arsenic to form a gaseous compound Arsin, AsH_3, and a solid compound having the composition As_2H_2. Only the first is of interest..

Arsin, or gaseous hydrogen arsenid, is produced when an arsenid is acted upon by hydrochloric acid, or whenever nascent hydrogen is released in the presence of arsenic in solution. For example,

$$Zn_3As_2 + 6HCl = 2AsH_3 + 3ZnCl_2.$$

$$6Zn + 6H_2SO_4 + As_2O_3 = 6ZnSO_4 + 2AsH_3 + 3H_2O.$$

Arsin has a peculiar odor, and is *intensely poisonous*, a single bubble being said to be sufficient to cause death. A stream of the gas when ignited in the air burns with a pale blue flame, producing a white cloud of arsenic trioxid. If a cold piece of porcelain is held in the flame, metallic arsenic is deposited as a shining mirror. This is the celebrated "Marsh's test" for arsenic, and is of such delicacy that 1-7000 grain can be detected with certainty.

If a tube through which arsin be passing is heated at any point, a mirror of reduced metal will be deposited in the cooler portions of the tube.

When passed into a solution of a silver salt the gas is decomposed, with precipitation of the silver, the arsenous oxid remaining in solution.

$$2AsH_3 + 12AgNO_3 + 3H_2O = As_2O_3 + 12HNO_3 + 12Ag.$$

Halogen Compounds.—With each of the halogens arsenic combines to form compounds consisting of one atom of arsenic to three of the halogen. These are the trifluorid, AsF_3; trichlorid, $AsCl_3$; tribromid, $AsBr_3$, and tri-iodid, AsI_3. The last named is official as *Arsenii Iodidum*, and is employed in the preparation of Donovan's Solution. A pentafluorid, AsF_5, has been prepared by the electrolysis of the trifluorid, the existence of other pentahalides is doubtful.

Oxygen Compounds. Arsenic forms two acid forming oxids, the trioxid, As_2O_3, (or As_4O_6) and the pentoxid, As_2O_5.

The first or trioxid is obtained whenever arsenical pyrites or other arsenic-bearing compounds are roasted in contact with air, passing off as a white cloud which may be condensed in suitable chambers. It is included in the U. S. P. under the title of *Acidum Arsenosum.*

As usually found in the shops it is in the form of a heavy, fine, white powder. The solid arsenous oxid exists either in the form of transparent, glass-like masses which are soluble in 30 parts of cold water, or in the opaque, porcelain-like lumps which require 80 parts of cold water for solution. The transparent variety gradually changes into the opaque form on standing. Both varieties are soluble in 15 parts of boiling water. Arsenous oxid is also soluble in glycerin, turpentine, hydrochloric acid, and in solutions of the alkaline carbonates and hydroxids. The aqueous solution is supposed to contain arsenous acid, H_3AsO_3, though this acid cannot be obtained in the free state.

Arsenous oxid, or "white arsenic," as it is frequently called, is odorless and tasteless. These qualities, together with its absence of color, render it peculiarly liable to be used as a poison, either through accident or with criminal intent. It is, however, one of the most easily detected poisons, and can be found in the tissues even after years have elapsed.

The most efficient antidote for arsenical poisoning is *freshly precipitated ferric hydroxid*, prepared by adding a solution of a ferric salt to diluted ammonium hydrate and washing the precipitate free from the excess of ammonia and ammonium salts. Instead of ammonia water, calcined magnesia may be mixed with the ferric solution until a soft magma is formed. This may be administered without previous washing.

The ferric hydroxid operates by combining with the arsenical compound to form a sparingly soluble basic ferric arsenite or ferrous arsenate. The antidote should be given in liberal quantities, and the treatment continued by the administration of emetics to remove the compound of arsenic and iron from the stomach.

By oxidation of the trioxid, the pentoxid is obtained, which when hydrated forms arsenic acid, H_3AsO_4, for which there is a corresponding series of salts known as the arsenates.

Sulfur Compounds.—Corresponding to the two oxids, arsenic forms two sulfids, the trisulfid, As_2S_3, and the pentasulfid, As_2S_5. It also forms a disulfid, As_2S_2, known in the native form as realgar. The trisulfid is formed when hydrogen sulfid, or an alkaline sulfid, is added to a solution of an arsenous salt. It is a bright yellow powder, soluble in alkaline hydroxids, carbonates and sulfids, from which solutions it is re-precipitated by the addition of acids. The pentasulfid is formed from the trisulfid by fusion with sulfur, or by precipitating an arsenic compound with ammonium sulfid. Its properties and solubilities resemble those of the trisulfid.

Other Compounds.—The arsenical compounds of the shop, besides the trioxid, are usually the arsenites or arsenates of other elements since arsenic exhibits only very slight basic properties. The well known *Fowler's Solution* is a preparation made by heating together arsenous oxid and potassium bicarbonate with water, and coloring the solution with compound tincture of lavender. It contains one per cent. of arsenous oxid. The official *Solution of Arsenous Acid* consists of one per cent. of the trioxid dissolved in water with the aid of hydrochloric acid. *Donovan's Solution* is a one per cent. solution of arsenous tri-iodid with one per cent. of red mercuric iodid. The well-known Paris green of the shops is a cupric aceto-arsenite, $Cu(C_2H_3O_2)_2.3Cu(AsO_2)_2$.

Sodium arsenate is an official compound of arsenic, and is preferred to most other arsenical compounds on account of its certainty of composition. A one per cent. solution is official under the title of *Liquor Sodii Arsenatis*

Characteristic Reactions.—The reactions of arsenic are numerous and important. Heated on charcoal with the blow pipe white clouds of arsenous oxid are formed, with production of the odor of garlic, the latter coming not from the oxid, but from the reduced and volatilized arsenic. Mixed with charcoal and heated in a glass tube the garlic odor is observed with production of the arsenic mirror on the colder part of the tube. Arsenous oxid heated with dry, powdered sodium acetate evolves the offensive and poisonous arsen-dimethyl-oxid or *cacodyl oxid*, $As_2(CH_3)_4O$.

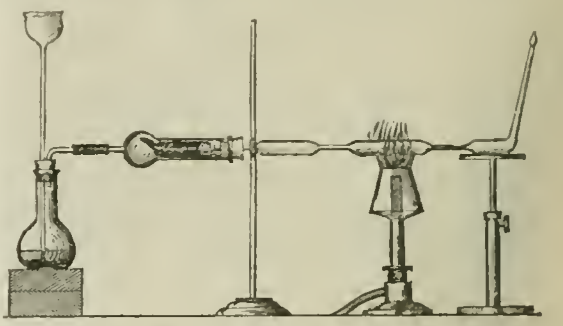

Fig. 35.—Decomposition of Arsenic by Heat.

Heated with hydrochloric acid and copper, a steel gray or bluish film of arsenic is deposited on the copper. Antimony, mercury and some other metals give a similar reaction. The arsenic deposit may be distinguished from the others by the sublimate of microscopic octahedral crystals which it yields on heating.

Any compound of arsenic in the presence of nascent hydrogen evolves arsin, AsH_3, which if passed through a heated tube deposits a mirror of metallic arsenic on the cooler portion of the tube. (Fig. 35.) The same mirror is produced if the stream of escaping gas is ignited, and a cold piece of porcelain is held in the flame. (Fig. 36.) Arsenites in neutral solution precipitate from silver nitrate yellow silver arsenite, Ag_3AsO_3, soluble in ammonia and in acids. Arsenates precipitate from silver salts the dark red silver arsenate, Ag_3AsO_4, with solubilities similar to the arsenite.

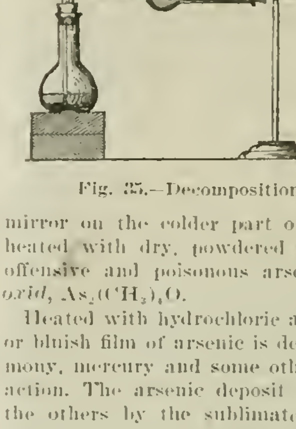

Fig. 36.—Marsh Test for Arsenic.

PRACTICAL STUDIES.

1. Place a small quantity of arsenous oxid on charcoal and heat with the blow pipe. Note all the results. Is there any odor evolved? Is there an incrustation on the charcoal? Can it be driven with the blow pipe flame?

2. Heat the middle portion of a narrow glass tube about 15 cM. long until it softens and draw the two ends apart. The result will be two tubes, each with a closed pointed end. Dry one of the tubes thoroughly by heating its entire length and introduce a mixture of equal portions of arsenous oxid and powdered charcoal, shaking carefully to the bottom. Heat the narrow portion containing the powder. Note whether an odor is evolved from the tube and whether any deposit is formed on the sides.

3. Heat one end of a glass tube about 10 cM. long until the bore closes. While still hot blow in the open end until the hot portion expands into a small bulb. Dry the tube by heating throughout, and allow to cool. Make a mixture of equal parts or arsenous oxid and dried and powdered sodium acetate and introduce into the bulb. Heat the mixture and note any odor which may be evolved. (The evolved vapors are poisonous, and should not be inhaled.)

4. Place a mixture of equal parts of water and hydrochloric acid in a test tube, add a strip of copper foil and heat. If the materials are free from arsenic the surface of the foil should grow brighter. Now add a few drops of solution of potassium arsenite or any other arsenous solution and continue heating. Does the copper change color?

5. Remove the copper, dry thoroughly, introduce into a clean, dry test tube, and apply heat. Does a sublimate form on the walls of the tube? If so, examine with the aid of a magnifier, and determine the crystalline form if any.

6. To a neutral solution of potassium or other arsenite add solution of silver nitrate. Compare the result with the next.

7. To a neutral solution of sodium or other arsenate add silver nitrate. Compare with the last. Write the equation.

8. Into a solution of an arsenite, or arsenous oxid, acidulated with hydrochloric acid, pass hydrogen sulfid, or add a *small amount* of ammonium sulfid diluted with ammonia water. Note the character of the resulting precipitate.

9. Separate a portion of the last precipitate, add ammonium sulfid, and if necessary warm gently. Does it dissolve?

10. To the last solution, add dilute HCl or H_2SO_4. What is the result?

ANTIMONY.

Symbol Sb. Atomic Weight, 119.6. Valence 3. 5. Specific Gravity 6.71-6.86.

Historical.—The trisulfid of antimony has been known since immemorial times. To the Arabs and Hebrews it was known as "Kohl" and was used by them for darkening the eyebrows, and is still employed for that purpose by the women of oriental nations. To the Greeks it was known as *stippi* or *stibi*, and to the Latins as *stimmi* or *stibium*.

According to Valentine the name Stibium is of Chaldean, and the name Antimonium of Latin, origin. The story that the latter name was derived from the circumstance that some monks were accidentally poisoned by its compounds, which were therefore termed "antimonie," meaning "*opposed to monks*," while amusing is, no doubt, apocryphal.

A method of obtaining the metal from its ore was first described by Basil Valentine in the latter part of the fifteenth century, but the free element had been known to the alchemists long prior to that time. As late, however, as the sixteenth century it was still confounded with bismuth.

Natural Occurrence.—The principal and most common ore of antimony is Stibnite, or the trisulfid, Sb_2S_3, found in various parts of both the old and new world. It is also found combined with arsenic, and in various complex compounds of antimony, sulfur and iron, copper, lead, nickel and silver. It also occurs to a limited extent in the free state.

Preparation.—The crude stibnite is commonly contaminated with silica and earthy impurities from which it may be removed by fusing, and permitting the melted sulfid to run off from the infusible material. By roasting in the open air the sulfur is driven off and the oxid is formed. The latter compound is then reduced to the metallic condition by heating with carbon, the latter element serving to carry off the oxygen. Or the sulfid, without roasting, may be heated with scrap iron, when the iron combines with the sulfur to form iron sulfid, leaving the antimony free. The metal thus prepared usually contains arsenic, iron and copper as impurities.

Description and Physical Properties.—Antimony is a silvery white metal, and possesses a brilliant luster. Cast antimony of good quality usually exhibits brilliant, star-like markings. Perfect crystals are obtuse rhombohedrons, closely resembling cubes. The specific gravity may vary from 6.71 to 6.86. The fracture may be either laminar or granular, according as the cooling was slow or rapid. The brittleness of the metal enables it to be easily powdered. It fuses at 425°, and can be vaporized at a bright red heat.

Chemical Properties.—Heated in the open air on charcoal it forms dense white clouds of the oxid, Sb_2O_3, which deposit as a white incrustation on the charcoal. It does not affect water at ordinary temperatures, but at a red heat decomposes it with formation of the oxid. Cold, dilute sulfuric acid does not dissolve the metal. The hot, concentrated acid dissolves it, forming antimony sulfate, with evolution of sulfur dioxid. It is readily soluble in hydrochloric or nitro-hydrochloric acid. Nitric acid oxidizes the metal, but does not dissolve it unless the acid be concentrated.

Alloys.—Metallic antimony is used in the preparation of several important alloys, to which it imparts hardness, fusibility, and the property of expanding at the moment of solidification, thus enabling a sharp impression of the mold to be taken. Type-metal is an alloy of antimony, lead and tin; britannia, or pewter, of antimony and tin; and Babbitt, or anti-friction metal, of antimony, lead, tin and copper.

LECTURE No. 30.

Pharmaceutical Physics.

Electro-Magnetic Currents. Applications of Electricity.

Electro-Magnetic Induction.—If a coil of wire is connected with a galvanometer, and a magnet be suddenly brought near, a deflection of the galvanometer needle will show the presence of a current in the coil. If the magnet be suddenly withdrawn a reverse deflection of the needle will show a reverse current in the wire. In fact any motion of the magnet to or from the wire, or of the latter to or from the magnet will result in a current traversing the coil. The current continues only so long as the motion continues, and ceases with it. Instead of moving a permanent magnet to or from the coil, an electromagnet might be used, and its magnetism created or destroyed at will by another current, but the same production of current in the coil would be noticed as before. So also a current would be produced in the coil of wire connected with the galvanometer by starting or stopping another current in a neighboring coil of wire, or by causing the latter coil to approach or recede from the galvanometer coil.

Currents produced in this way are known as *induced currents*, and are due either to the motion of a conductor across the lines of force of a magnet or electric current, or to some motion of the latter with relation to the conductor. At any instant *the electromotive force of the induced current is proportional to the rate of change in the number of lines of force passing through the circuit at that instant.*

Induction Coil.—When a current flowing through one conductor is made to develop a current in another conductor, the inducing current is called the *primary*, and the induced the *secondary*.

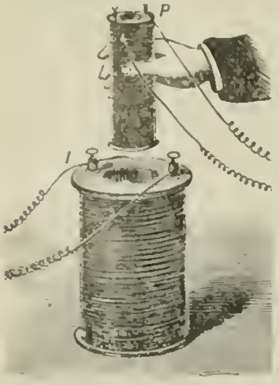

Fig. 100.—Primary and Secondary Coils.

If the primary is passed through a short coil of thick wire which serves as a core to a large coil of long thin wire in which the secondary is produced, the arrangement is known as an *induction coil*. (Figs. 100 and 101.)

In the induction coil some means is provided by which the circuit of the primary is opened and closed very rapidly, usually by means of a make and break piece. Usually a bundle of soft iron wires is inserted in the primary coil which becomes an electro-magnet when the primary current is passing, and thus greatly intensifies the secondary current.

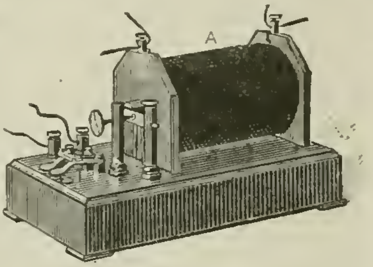

Fig. 101.—Horizontal Induction Coil in Case.

The iron core may also be utilized in the construction of the make and break piece. For this purpose a steel spring (c.b., Fig. 102) connected with one end of the primary wire, carries at its top a small piece of soft iron so held that it is directly in front of the core, but without touching it. At the moment of starting the current the spring closes the circuit of the primary wire, whereby the iron core becomes a magnet and attracts the soft iron of the spring. The latter moves toward the core and in so doing breaks the primary circuit. The core now ceases to attract the hammer, which then flies back to its first position, closing the primary circuit again, and so on.

On account of the great length of the secondary coil compared with the primary, and the rapidity with which the primary circuit is made and broken, the secondary current has enormously greater electro-motive force than the primary. By using the primary current from several ordinary cells with a sufficiently large secondary, the current of the latter may be raised to an electro-motive force of thousands of volts, sufficient to pierce glass 15 cM. in thickness, and yield sparks a meter or more in length.

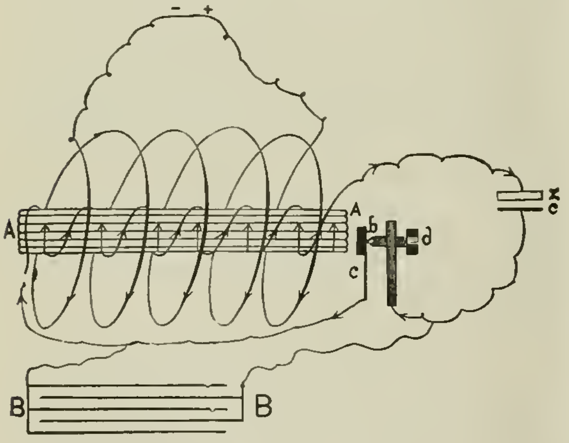

Fig. 102.—Diagram of Ruhmkorff Coil.

Ruhmkorff Coil.—This differs from the preceding only in having a condenser, consisting of layers of tin foil separated by paraffined paper, and alternately connected with the + and — electrodes of the primary circuit. (B. B. Fig. 102.) Without the condenser, the time of breaking is prolonged by the current vaporizing the points of contact and bridging the gap between. When the condenser is attached it serves as an escape for the extra current and prevents sparking between the primary terminals. The time of breaking is thus diminished and the intensity of the secondary current correspondingly increased.

Induction coils are used for a variety of chemical, mechanical, and therapeutic purposes and have lately acquired popular interest from their use in the production of the Röntgen or X-rays.

Mechanical Generation of Electric Currents.—From the preceding it has been learned that when a conductor is moved through a magnetized field a current is developed in the conductor. This principle therefore affords the means of utilizing the cheap mechanical energy of waterfalls and steam engines in the production of the electric current instead of such costly substances as are consumed in galvanic batteries. It is in fact by this cheap mechanical method that all the electric currents employed for street lighting and for the propulsion of cars and other commercial purposes generally are now obtained.

The Dynamo.—The machine employed for the conversion of mechanical energy into electric energy is called a *dynamo*.

Under the experiments named in connection with the induction coil we have seen that the strength of current obtained depends upon several particulars, of which the following are the more important: the specific conductivity of the wire, the number of turns in the coil, the rapidity of the motion, and the strength of the magnetic field. Upon the development of these several qualities in due proportion depends the success of the dynamo as a current producer.

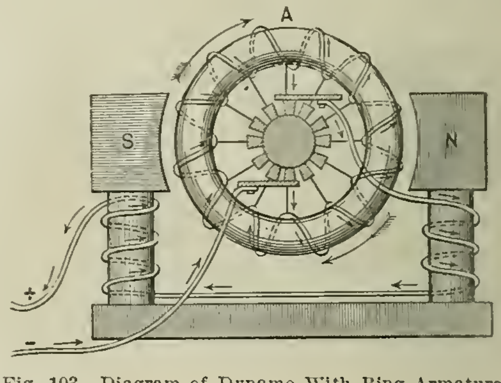

Fig. 103.—Diagram of Dynamo With Ring Armature.

Notwithstanding the numerous patterns of this machine in use, the principle of construction is the same in all, namely, a coil or series of coils of wire arranged in a compact form called an *armature*, and caused to revolve rapidly in a magnetic field created by the poles of a powerful electro-magnet.

The two chief types of armature are the *Gramme ring armature*, and the Siemens *drum armature*.

The Gramme armature consists of an iron ring wound with insulated wire in such a way that the wire forms an endless coil. (Fig. 103.)

The Drum armature is a cylinder of iron wound lengthwise with insulated copper wire, also in an endless coil. (Fig. 104.)

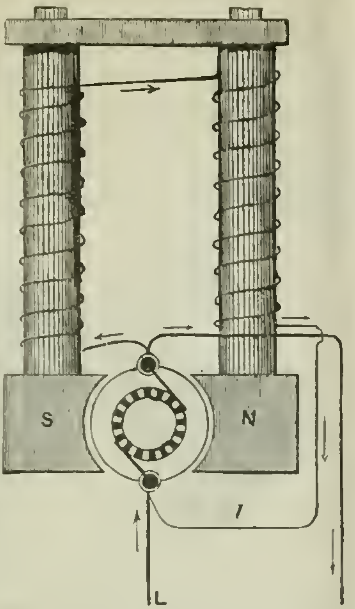

Fig. 104.—Diagram of Dynamo With Drum Armature.

When either of these armatures is turned between the poles of a magnet a current is set up in one direction in the coil of one side of the armature, and another in the opposite direction in the portions of the coil on the other side. These currents are conducted to metallic surfaces on the axle of the armature and are here taken off by means of pieces of copper known as "brushes," which form the connections with the outside circuit. Fig. 105 exhibits appearance of finish dynamo with drum armature.

The electro-magnet which produces the field may either be separately excited by a galvanic battery or another dynamo, or a portion of its own current may be caused to pass around the poles. In the last case the poles must retain a little residual magnetism in order to start the current when the armature is set in motion.

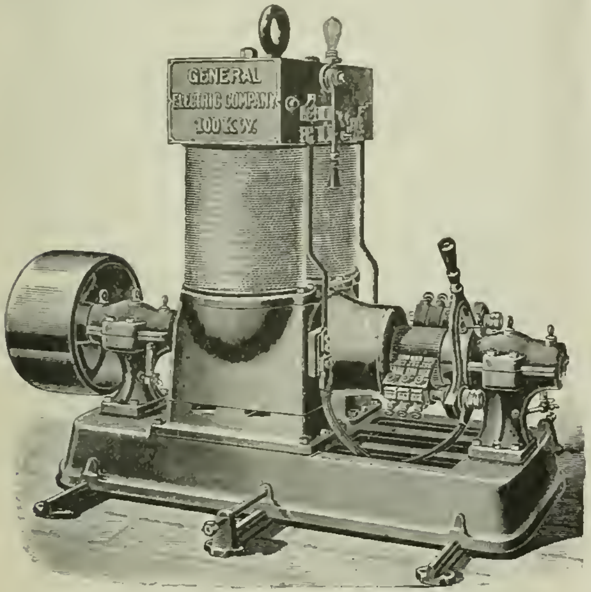

Fig. 105.—Modern Dynamo.

Permanent magnets cannot be made sufficiently powerful for large machines, and are only employed where strong currents are not required.

Alternating and Direct Current. The Commutator.—As the direction of the current in a conductor depends upon which pole of a magnet it fronts, it follows that the current in any portion of the armature will be reversed as it passes from one pole to the other, and will pass out through the brushes first in one direction and then the other. Such currents are known as *alternating currents*.

If a *direct* current is wanted, or a current in one direction only, a device called a *commutator* is made use of. A simple form of this is a divided brass ring covering the end of the armature spindle, and connecting the coil on the armature with the brushes in such a way that when the current reverses in the armature, the commutator also reverses its connection with the brushes, so that the + current always flows out through one brush and the — current through the other, no matter what the direction may be in the coils.

The Electric Motor.—In the dynamo the current is produced by causing a conductor to revolve in a magnetic field, and the development of electric energy is proportional to the mechanical energy required to revolve the armature against the resistance offered by the lines of force. The dynamo, then, is simply a device for the conversion of mechanical into electrical energy. This process can also be reversed, for if a current generated by one dynamo is passed in through the brushes of another, the armature of the latter will be caused to revolve, but in a direction opposite to the armature of the machine from which the current comes. It is customary, therefore, to say that a *motor* is simply a dynamo reversed, though owing to the different purpose which they are intended to serve there is usually more or less variation in the details of the two machines. By attaching a pulley to the spindle of the armature the rotation of the latter can be communicated to machinery through belting.

PRACTICAL AND PHARMACEUTICAL APPLICATIONS OF ELECTRICITY

The practical applications of electric energy to the purposes of civilized life are daily becoming more numerous, and not a few of these have a particular interest for the pharmacist. As it would obviously be impossible to give a description of all of them, we shall content ourselves with a brief account of such as are of the most direct importance to pharmacy, either in its scientific or in its trade relations.

The Electric Light.—Two methods of producing light by the electric current are in common use, known respectively as the *arc* and *incandescent* systems.

The arc lamp consists, in brief, of two rods of gas carbon so arranged that their ends are first brought together and then separated, and automatically kept at the same distance while the lamp is in operation. A powerful current generated by a dynamo flows through the heavy copper conductor with comparatively little resistance, but when it reaches the gap between the carbon rods the resistance is increased enormously, and the heat thereby developed heats the carbons to incandescence, and a curved, bridge-like arc of light spans the distance between the carbons. The framework of the lamp also supports a case containing the mechanism whereby the carbons are kept at nearly the same distance apart, notwithstanding the slow wasting away which they undergo when the current is passing.

The incandescent lamp consists of a pear-shaped globe, through the smaller end of which passes two platinum wires which inside are continued in the form of a filament of carbonized bamboo. When the current passes the carbon thread is heated to incandescence, and would take fire and consume instantly were it not for the fact that before the globe is sealed it is exhausted by means of a mercury air pump until only a small portion of its original atmosphere remains.

Arc lamps are usually joined in series so that the whole current from the dynamo passes through each lamp. On account of the extremely high voltage required (1,000 to 3,000 volts) the current from such a circuit is exceedingly dangerous when accidentally passed through the body.

Incandescent lamps are generally coupled in multiple arc, so that each lamp receives only a portion of the current in the circuit. Such currents range from 50 to 120 volts and are consequently much less dangerous to life. The danger line lies between 300 and 500 volts.

The Electro-Magnetic Telegraph.—The electric telegraph invented by the American, Prof. Morse, in 1837, consists of an electric circuit between different stations which

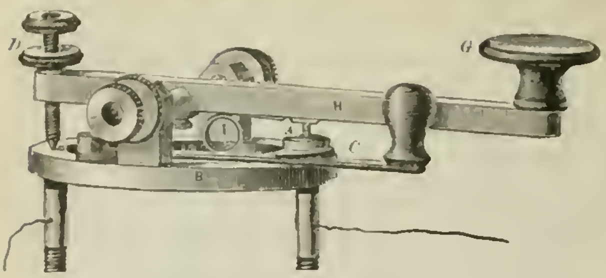

Fig. 106.—Telegraph Key.

can be opened and closed at will. The sending instrument is known as a *key* (Fig. 106), and the receiving instrument as a *sounder* (Fig. 107.) When the handle of the key is pressed down by the operator the circuit is closed and a current passes through the wire. At the receiving station the current traverses a coil of wire surrounding an iron core which thus becomes an electromagnet and attracts an armature to which is attached a metallic bar, and this in falling strikes a metal piece with a sharp, distinct click. When the circuit is opened by the sender the magnetism of the electro-magnet of the sounder is destroyed, and the bar is drawn back to its former position by means of a spring. By varying the number of sounds and the intervals of time between them each letter of the alphabet may be represented, and in this way messages are spelled out.

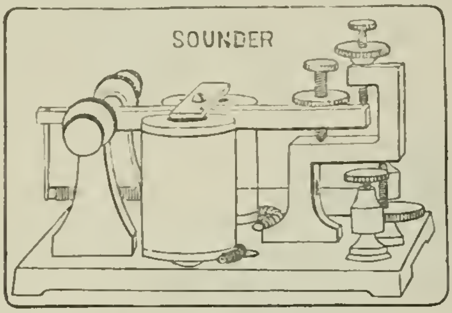

Fig. 107.—Telegraph Sounder.

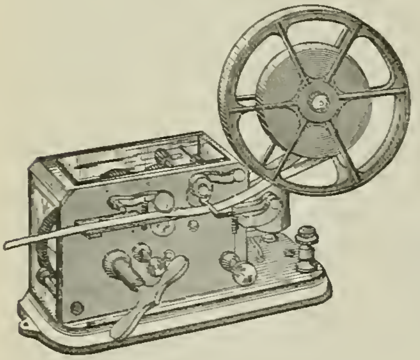

Fig. 108.—Registering Telegraph.

In the registering telegraph a ribbon of paper is unrolled by clock work and caused to pass under a pen or metallic point attached to the armature. (Fig. 108.) If the point rests upon the paper for only an instant it makes a dot, or if it remains longer a dash. The letters are thus represented by combinations of dots and dashes. At each end of the line the wire is connected with the earth, so that only one wire need be used, the earth acting as the return circuit.

The Telephone.—The telephone is a device by means of which sound waves at one end of a line may generate electric currents which travel along a wire and set up new sound waves at the opposite end. The modern Instrument consists of two parts, the *transmitter* and the *receiver*.

The telephone in its original form consisted of a bar magnet surrounded by a spool of insulated wire connected with the circuit, and directly in front of the magnet a thin iron disk or diaphragm. (Fig. 109.) By talking in front of the disk it is thrown into rapid vibration by the sound waves and the motion thus set up produces electric currents in the coil surrounding the bar magnet and consequently in the whole circuit. At the opposite end these currents in turn cause variations in the magnetic field, causing the disk to alternately approach and recede from the magnet, thus reproducing the original sound waves. In such a circuit the transmitter is virtually a dynamo and the receiver a motor, and no battery is necessary.

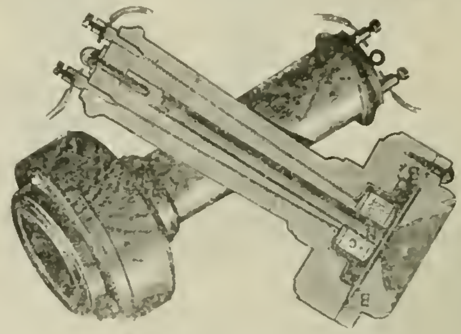

Fig. 109.—Telephone Transmitter.

In the modern instrument the current is supplied by a Leclanche cell, the vibration of the metallic disk serving only to vary the intensity of the current by varying the resistance in the circuit.

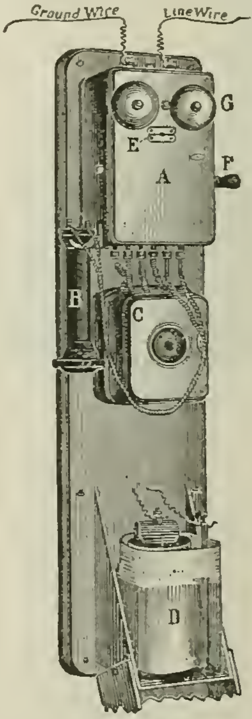

Fig. 110.—Modern Telephone.

Another improvement is the addition of an induction coil which furnishes the current for the line, the Leclanche cell simply supplying the current for the primary coil. The result of the addition of the battery and induction coil is to increase the strength of the currents which traverse the line, intensifying the vibration of the disk of the receiving instrument, and rendering the sounds produced more distinct.

The completed instrument includes, in addition to the parts already described, a small dynamo contained in the upper part of the case. (Fig. 110.) When the crank is turned a current is produced which rings a bell both at the transmitting and receiving instrument. When the receiver which hangs at the side is removed from the hook the latter rises, and in so doing throws the dynamo out of the circuit, and closes the circuit which includes the local battery, the receiver and the transmitter. As in the telegraph the ground connection serves as the return circuit. (Fig. 111.)

Medical and Surgical Uses.—Pharmacists are frequently called upon to supply batteries intended for the application of the electric current for medical purposes. While there are many varieties of these, the principle of construction is essentially the same in all, the differences consisting mainly in matters of detail. They include, first of all, one or more galvanic cells, usually of the Grenet type, in which the plates are respectively of carbon and zinc, and the exciting and depolarizing fluid a solution of potassium dichromate and sulfuric acid, the current thus produced serving as the primary current of an induction coil. The secondary current because of its greater intensity is the one applied. Commonly some means of varying the intensity is added, as by introducing or withdrawing the primary coil, or a core consisting of a bundle of iron wires. The electrodes may be held in the hands, or applied directly to the parts affected. The current may be applied to the stomach by having the patient swallow a small metallic electrode attached to a flexible rubber covered wire, or instead of an electrode, a small incandescent lamp may be attached, and used for illuminating the cavities of the body.

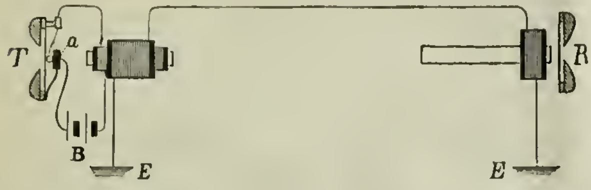

Fig. 111.—Telephone Circuit.

For surgical purposes the electrode may be made of platinum, which is heated to incandescence and used as a cautery, or if in the form of a wire loop, may be used for the excision of morbid growths instead of a knife, the cauterization of the parts operating to restrain the hemorrhage.

Electroplating and Electrotyping.—For electroplating there is required a galvanic battery or other source of current, and a bath or solution of some salt of the metal which is to be deposited. The object to be plated, say of copper, is immersed in the bath and connected with the cathode, or negative electrode, and a sheet of the metal which is to be deposited, e. g., silver, is hung upon the anode, or electrode, through which the current enters the solution. (Fig. 112.) The current in traversing the solution decomposes it, the metal being deposited on the object at the cathode, and the acid released at the anode, while it dissolves some of the metallic plate there suspended, thus keeping the solution of uniform strength.

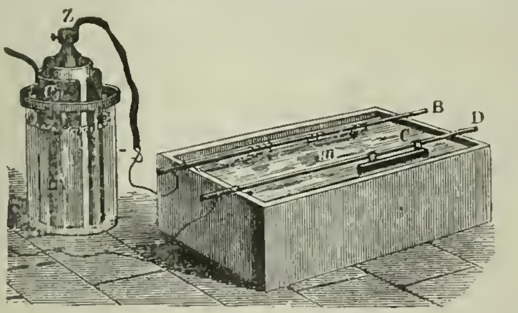

Fig. 112.—Electroplating.

In electrotyping an impression of the type or other object to be reproduced is first made in wax. The wax is then covered with powdered graphite to make it a good conductor, and is then hung on the cathode. The bath is a solution of a copper salt, and the plate at the anode is of copper. The copper salt is decomposed by the current, the metal being deposited upon the plumbago plate, and the acid released at the anode where it attacks and dissolves the copper, the process taking place in all respects as in electroplating.

When the deposited film of copper is of sufficient thickness it is detached from the wax and strengthened by pouring melted type metal upon the back. The plate thus prepared is fastened to a wooden block to make it type high, and is then ready for printing.

Electro-Chemical Analysis.—The principle of electroplating may be employed in the chemical laboratory in the analysis of the salts of such metals as are perfectly deposited by the electric current. When used in this way the process is known as *electro-chemical analysis*, and when applicable is remarkable for its convenience, cleanliness, and accuracy.

The operation may best be illustrated by a description of the analysis of a simple salt of copper.

A measured amount of the solution, say, of cupric sulfate, is placed in a beaker and slightly acidulated with nitric acid. For the cathode, or surface upon which the copper is to be deposited, there may be used a platinum crucible, a piece of platinum foil, or any other platinum surface of sufficient size. For the anode, or electrode through which the current enters the solution, there may be used a spiral of platinum wire. The cathode piece, having been thoroughly cleansed and accurately weighed, is connected with the zinc plate of a battery and immersed in the solution, while the anode is connected with the copper or carbon plate of the battery and also immersed in the solution to be analyzed, but without touching the cathode, and the current turned on. After the current has passed for some hours the solution will have become colorless, while the copper will have been completely deposited upon the platinum cathode in the form of a hard, adherent coating. The cathode is then removed, washed, dried and weighed. By subtracting the weight of the platinum the quantity of copper which was in the solution is known without further calculation.

To clean the cathode for subsequent operations it is only necessary to dip it a few moments in nitric acid, and rinse it in water.

GENERAL PHARMACY OF DRUGS FOR HOMŒOPATHIC USE.*

Essentials of Homœopathic Pharmacy.—The pharmacy of medicine for homœopathic use differs in many essential details from other and older methods. Although accuracy is the basis of every method, it is doubly important in homœopathic pharmacy, whose distinctive feature is its simplicity. Drugs, when prepared as medicines for homœopathic use, are never mixed or compounded, but to render them available for use, each in its natural state is, after proper subdivision, added singly to some vehicle which will serve the purpose of a preservative, as well as a means of extension. Cleanliness, also, as acquired by homœopathy, differs as much from that of the older pharmacy as the cleanliness of modern surgery differs from the practice before the days of antiseptic methods. It involves the most conscientious care in handling drugs of different kinds, and in keeping them from contact with each other; in storing so as to protect from vapors, odors and dust of others, and in keeping them in cool, airy, dry and darkened places.

The Unit of Medicinal Strength.—In accordance with the suggestion made by the Special Committee, and adopted by the American Institute of Homœopathy, at Niagara Falls, in 1888, the Pharmacopeia Committee have prescribed the necessary rules to make the dilutions to correspond in medicinal strength (drug-power), with triturations of the same number. This is in accordance with the intention of Hahnemann, and also with that of the older authorities on homœopathic pharmacy. In illustration, we quote substantially from the Materia Medica Pura of 1824, Vol. 2, page 30, and refer also to the Chronic Diseases, page 182 (German edition), 1835, relating to the making of triturations:

"In order to make alcoholic medicinal solutions of uniform strength, and to obtain from them readily determinable dilutions, add 20 parts of alcohol to one part of finely powdered drug-substance of such plants as are to be obtained only in their dry state." . . . .

"Each drop of such a tincture is to be considered as equal to one-twentieth (1-20) part of medicinal power. In order to dilute it for homœopathic use, the directions given under the head of 'Arsenic' are to be followed. For this purpose take a vial containing 500 drops of alcohol, and add one drop of the strong tincture. This, after proper succussion, will yield a dilution to be labeled 1-10000; each drop in this vial containing one ten-thousandth part of the medicinal power (substance)."

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* Pharmacopeia of the American Institute of Homœopathy.

"As the juices of fresh plants are in general prepared for homœopathic use with equal parts of alcohol, it follows that each drop of this dilution is to be considered as containing one-half of a grain of medicinal power (substance). Hence, in the making of dilutions, two such drops are first intimately mixed with 98 drops of alcohol, in order that each drop of this mixture may contain 1-100 of the power of the plant, the vial to be labeled accordingly. The next dilutions are made as before directed."

Hahnemann's object evidently was to formulate a standard rule according to which all alcoholic medicinal solutions (tinctures, extracts, etc.) and their dilutions might be made of uniform drug power to be represented by the dry crude drug as the unit of strength in the case of tinctures made from dried substances, and by the plant-juice as the unit when made from fresh green drugs.

To avoid the double standard made by Hahnemann, and to secure uniformity in strength (drug-power) of all preparations and attenuations, thereby making dilutions and triturations of equal degree correspond in medicinal strength, the committee have in all cases made the dry crude drug the unit from which to estimate strength. It should be understood, however, that the fresh green materials are still required in the preparation of tinctures, and that the plant-moisture is to be regarded as a part of the vehicle or menstruum, it being evident that the water contained in the plant is but a solvent and forms no part of its medicinal substance. Adopting this rule in our tincture-making process, we have followed that excellent authority, the British Homœopathic Pharmacopeia, thereby securing uniformity in strength. To quote from this work, Part I., pages 11 and 12: "In every instance, the dry crude substance is to be taken as the starting point from whence to calculate its strength, and, with very few exceptions, the mother tinctures contain all the soluble matter of one grain of the dry plant in ten minims of the tincture."

The tincture, therefore, representing as it does one-tenth part medicinal substance, or, in other words, the soluble constituents of one-tenth its substance of crude drug, should represent the 1x (1-10), thereby corresponding in strength with the 1x trituration. Uniformity is thus secured and the signs 1x or 1-10, on whatever form of attenuation they may be found, will always represent a drug power of one-tenth; the sign 2x will show the presence of 1-100 part drug substance, and the familiar 3x will show 1-1000 part.

Unknown Substances.—A homœopathic pharmacopeia should not be encumbered with descriptions of uncertain and little-known substances, as drugs which have not been properly "proved" or tested for their pathogenic effects upon the normal living organism are of no value to the physician, and therefore of no importance to the pharmacist, who will not seek them in a work of this kind.

The Apparatus Essential to Homœopathic Pharmacy consists of vessels and implements for the making of tinctures and solutions and for the trituration or grinding of hard and dry as well as of moist and soft substances with milk-sugar. Such implements, while common to general pharmacy, deserve some explanation relating to their use in homœopathic pharmacy.

These utensils, few in kind, include macerating jars, funnels and percolators for tinctures and other fluid preparations containing the soluble portions of vegetable substances; also, mortars with their pestles and sieves, for the grinding or sifting of hard or insoluble substances.

Special Description.—Macerating jars, percolators, funnels and all vessels used in homœopathic pharmacy should be of glass or glazed porcelain. No porous substance or metal will sufficiently protect drugs from contamination with each other.

From the beginning of homœopathic pharmacy it has been held as an inviolable rule to provide a separate macerator, percolator, funnel or vessel of any kind for the preparation and preservation of each drug. As far as possible this ideal rule should be observed.

Presses should be lined with block tin, as this is not porous and is practically insoluble.

Chopping-boards are unobjectionable if a separate one is provided for each article to be chopped on it. The board should previously have been cleansed by steam, a method to be mentioned later.

Cleanliness and Cleansing of Utensils.—The danger of contamination of medicines with each other, or with the impurities from many other sources, merits some special consideration. The whole subject of utensils and their cleanliness in homœopathic pharmacy is embodied in the principle that each medicine must be prepared and administered singly, that is, without admixture or contamination with other medicines or noxious influences of any kind.

It has always been the aim of physicians and pharmacists to carry out this principle most minutely, especially on account of the extreme fineness of attenuations, fluid or dry, the protection of which against contaminating influences is justly to be considered as an object more difficult to obtain than hitherto deemed possible. For the present we are limited to the following methods and precautions:

For the purpose of cleansing utensils it will serve to wash and then to rinse them with the purest obtainable common water, after which distilled water, and, lastly, alcohol is to be used. The vessel or other implement is then to be inverted on blotting paper or some pure absorbent material until dry.

We would also urge that cleansing by steam on a properly constructed apparatus would insure the most perfect destruction of organic and other impurities. An apparatus of this kind need not be bulky, complicated nor expensive, and would save much time and labor. It could be applied to bottles and other vessels, as well as of mortars, pestles, percolators, macerators, etc. It has always been the custom to provide one of the last-named articles for each medicine, a condition which it is neither unreasonable nor difficult to fulfill, but it may be so in the case of more cumbersome and costly appliances for the production of pharmaceutical material on a large scale. It is here that steam cleansing would prove effectual and practical.

Menstrua, Vehicles or Solvents.—These should be inert, non-toxic substances, such as milk-sugar, water and glycerin. But as these are unable to dissolve or extract the toxic (medicinal) properties of most substances, *alcohol* is preferably used, for its superior solvent and preservative qualities.

The latter is not inert nor non-toxic, and is therefore not strictly in harmony with the principle of singleness of medicines. Yet, as there is no other menstruum which will serve the same purpose, the drug-substance held in solution by it preponderates so largely that the effect of the solvent vehicle is not generally noticed; or, where that is the case in the proving of tinctures, or in their therapeutic use, the effect is to be eliminated by its characteristic signs.

If an attenuated dilution, made as is usual with alcohol, is added to water or milk-sugar, the volatility of alcohol renders it innocuous and imperceptible. The chief advantage is that it does not alter the chemical, toxic and medicinal properties of drugs, while at the same time it is their most reliable preservative, retaining their active properties for an indefinite time.

DRUGS AND MEDICINAL SUBSTANCES.

A brief definition of the subjects, according to the tenets of homœopathy, may assist the pharmacist in his important calling and is here subjoined:

Drugs are to be defined as substances which have the power of disturbing the health of the living organism. Each drug is capable of exerting this power in a manner peculiar to itself, and therein differs and may be distinguished from other drugs in their tests (provings) upon the normal organism.

The toxic or pathogenic property or power of drugs under certain conditions known to the physician, becomes a curative agent in disease. Hence, substances which are primarily toxic or pathogenic, are secondarily medicines when prescribed in disease, and prepared for that purpose by the pharmacist.

Derivation of Drugs.—The mass of drugs, that is, the *Materia Medica*, is derived from, and already represents, all great natural divisions, such as animals, plants, minerals, and also many artificial products of chemistry.

In the early days of homœopathy, physicians, unable to obtain their materials in any other way, were obliged to collect and prepare their own medicines. But the increase in numbers of homœopathic physicians and their growing duties soon compelled them to intrust the preparation of medicines to pharmacists trained in the special methods of the homœopathic school. Homœopathic pharmacy, therefore, naturally fell into the hands of firms who obtain and prepare their material in large quantities. But it is still as desirable as ever that physicians should know how to prepare their own medicines and to collect their material for that purpose, according to the following general rules.

Of the thirty-two or more animal substances, only a few are in common use. Plants used as homœopathic medicines are much more numerous. Next to them in frequency of use come the chemical preparations, metals and minerals.

Animal substances should be obtained from perfect and healthy specimens, and prepared in their pure and unadulterated state, unmixed with any other substance. They should be protected against light, air and moisture, if they are to be preserved before being made into tinctures or triturations.

Whole Plants.—These are to be collected in the flowering season during sunny weather. They should be carefully cleaned by shaking, gentle rubbing or brushing, without the contact of much water; or, still better, only clean specimens are to be selected.

Leaves and Herbs (*Folia, Herbæ*), are to be collected when fully developed, shortly before the flowering season.

Flowers (*Flores*), are most advantageously collected when just about to open, and in dry weather.

Stems (*Stipites*), are cut after the development of the leaves, and treated like these.

Barks (*Corticles*) of resinous trees are collected at or about the time of development of leaves and blossoms. Non-resinous barks are collected late in the autumn from young, vigorous trees.

Woods (*Ligna*) are gathered early in the spring before the sap rises, also from vigorous young trees and tree-like shrubs.

Roots (*Radices*).—Those of annuals, as they die after the ripening of the seeds, are dug early in the fall. Those of biennials, in the spring. Perennial roots are collected in the second and third year, before they develop woody fibre. They should be cleansed without the use of much water, and used as fresh as possible. Roots obtained in the market should be carefully examined for mouldiness, dampness and woody appearance.

Fruits, Seeds and Berries (*Fructus, Semina, Baccæ*), are with few exceptions gathered when ripe. If succulent, they should be used for tinctures, etc., at once, while fresh and perfect. Only dried seeds and fruits may be kept in well-closed vessels.

(To be Continued.)

PHARMACY.

DUOTOL.—Trade name for guaiacol carbonate.

CITRULEA.—Tablets composed of urea, lithium bromide and citric acid.

OMAL is a trade name for trichlorphenol. Used as an inhalation by consumptives.

MYELEN is an extract of beef marrow, prepared with water, glycerin, a little alcohol and aromatics.

ACETOCAUSTIN is a 50 per cent. solution of trichloracetic acid, intended to serve as a caustic for corns, etc. (Südd. Ap. Ztg.)

LYSOSOLVEOL is a mixture of 38 per cent. potassium linoleate, 44.5 per cent. cresols, and 22.5 per cent. water. Soluble in water.

ANILIPYRIN, made by fusing together 1 part acetanilid and 2 parts antipyrin, is expected to unite the effects of both components. (Südd. Ap. Ztg.)

THANATOL, also called Guaethol, is the ethyl ether of pyrocatechin. Recommended for tuberculosis, also externally for rheumatism. (Südd. Ap. Ztg.)

MENTHOL-CHLORAL PENCILS may be made by mixing chloral hydrate, 1 part; menthol, 1 part; cacao-butter, 2 parts; spermaceti, 4 parts. (Ztsch. f. Ph.)

MALARIN is an antipyretic, which cures the most violent facial neuralgia in a few days with 0.5 gm. (8 grs.) twice daily. It is also anti-spasmodic. (Ph. Post.)

CASEOIODIN is a substance similar to thyroiodin, prepared from periodocasein. A white powder containing 8.7 per cent. of iodine. Excellent results in struma are reported. (Ph. Post.)

BLENNOSTASIN is the name of a substance claimed to be a derivative of a cinchona alkaloid. It somewhat resembles atropine in its physiological action, but is not poisonous. It has been used with success in hay fever and influenza. (Ztsch. f. Ph.)

TINCTURE OF ICELAND MOSS, of 20 per cent. strength, prepared with 80 per cent. alcohol, has been found very useful in doses of 30 to 50 drops to relieve nausea. Experiments are under way to learn more of the active constituents. (Rep. de. Ph.)

ACETSULPHANILID OF SODIUM.—A white, crystalline, hygroscopic mass, easily soluble in water, less so in alcohol, insoluble in ether. Used as antipyretic. Preferable to antipyrin because of its more rapid effect, due to greater solubility. (Ph. Post.)

PYRAMIDON, or dimethylamido-antipyrin, is lauded as a prompt and safe antipyretic. Its advantages over antipyrin are smaller dose and no unpleasant after effects. It may be given for months without need of increasing the dose. (Südd. Ap. Ztg.)

EXTRACTION OF GUTTA-PERCHA FROM LEAVES.—The leaves come from Borneo and Johora and are worked up in Singapore. They are first steamed and then ground up between rollers. The ground leaves are transferred to a water tank and stirred up, which causes a separation of the gutta-percha as a greenish mass. This is taken out with nets of fine copper gauze, washed with warm water and pressed into forms. (Ap. Ztg.)

INDELIBLE INK WITHOUT SILVER NITRATE.—Grind 1¾ grammes of aniline black well with 60 drops of strong hydrochloric acid, and 42 to 43 grammes of alcohol. The liquid thus obtained is diluted with a hot solution of 2½ grammes of gum arabic in 170 grammes of water.—Sci. Am.

IODOFORM BOUGIES.—The following is recommended as yielding a very elastic product: Iodoform, 2 gm.; acacia, in impalpable powder, 1 gm.; mucilage of acacia and glycerin, of each a sufficient quantity. The mass is rolled out on a marble slab or on parchment paper. The rolls are dried. (Ph. Post.)

ARTIFICIAL CAOUTCHOUC.—A substance resembling hard rubber is obtained by mixing 4 parts of nitrocellulose with 7 parts of bromnitrotoluol. By changing the proportions a more or less elastic product can be obtained. Bromonitrotoluol may be replaced by nitrocumol or its homologues.—Reve de chem. indust.

CHINORAL.—A chloral-quinine preparation of viscid, oily appearance, very bitter, and easily soluble in water and alcohol. It is a non-poisonous antiseptic, said to be more effective than solutions of corrosive sublimate of equal strength. Also an effective hypnotic, given in delirium tremens. (Ph. Post.)

SOLUTION FOR DESTROYING MOTHS.—Dissolve 20 parts naphthalin, 20 parts carbolic acid, and 50 parts camphor in a mixture of 50 parts oil of turpentine and 850 parts 90 per cent. alcohol, then add 5 parts each of oil of mirbane and oil of patchouli. The solution is used as a spray.—(Drog. Zt.)

MENDING CRACKED RUBBER HOSE.—The damaged part, previously well cleaned and dried, is painted over with hot oil of turpentine. A thin sheet of gutta-percha, softened by heat, is put round it so that the edges meet, and is pressed against the hose with a knife blade. The edges are finally cemented together by touching the seam with a moderately hot iron rod.

IODOTERPINE is a new product resulting from the direct combination of iodine and terpine. It is a dark brown liquid, soluble in alcohol, ether, chloroform, benzol, and petroleum ether. It contains about 50 per cent. of iodine and is readily absorbed by the skin. For application to sores it is mixed in powder form with sterilized kaolin. (Jour. de. Ph.)

RAPIDLY DRYING AMBER VARNISH is prepared by a patented process as follows: 4 parts of powdered amber are thoroughly mixed with 1 part of stearic acid and converted into a tough mass by heating. This is brought into solution by warming with 1 part of benzin. Then ½ part of linseed oil is added and air passed through until a sample of the mixture makes a rapidly drying film when spread out. (Ap. Ztg.)

GLYCYRRHIZIN TROCHES, as substitutes for licorice root or extract:

(1)	Amm. glycyrrhizin	1	gm
	Powd starch	20	gm
	White sugar	80	gm
	Oil of cherry-laurel	1	drop
	To make 100 troches.		
(2)	Amm. glycyrrhizin	1	gm
	Powd. starch	20	gm
	White sugar	80	gm
	Codeine hydrochlor.	0.8	gm
	Oil of cherry-laurel	1	drop
	To make 100 troches.		
(3)	Amm. glycyrrhizin	1	gm
	Powd. starch	20	gm
	White sugar	80	gm
	Codeine hydrochl.	2	gm
	To make 100 troches.		

—(D. Ph. Post., through Südd. Ap. Zt.)

EUCHININ.—Experiments to determine the therapeutical value of euchinin have led to the following conclusions: (1) It has the advantage over ordinary cinchona alkaloids of being almost tasteless and therefore very readily given to children in such vehicles as syrup, milk, cocoa, etc. (2) In the treatment of malaria it shows the characteristic action of quinine. (3) It is entirely innocuous. (Ap. Ztg.)

A NEW SOLUBLE COMPOUND OF ARSENIC.—If arsenous acid be dissolved in a boiling solution of sodium bitartrate, the solution will, on concentrating and cooling, deposit crystals of a compound having the composition $AsONaC_4H_4O_6$. $2\frac{1}{2}H_2O$, an arsenotartrate of sodium. Similar combinations are obtained with the bitartrates of potassium and ammonium. These salts are intended to replace arsenous acid and potassium arsenite in medicine. (Oest. Ztsch. f. Ph., through Jour. de Ph.)

MENTHOXOL, CAMPHOROXOL, AND NAPHTHOXOL.—These preparations contain hydrogen dioxide in 3 per cent. solution as the essential constituent, combined respectively with menthol, 1 per cent.; camphor, 1 per cent.; and naphthol, 2 per cent.; and alcohol, 32 per cent. in camphoroxol; 38 per cent. in the two others. Their use in the treatment of wounds has been found quite satisfactory. They checked decomposition, stimulated granular formation and deodorized effectively.—(Med. Wochenschr., through Ap. Zt.)

FORMOFORM DUSTING POWDER.—A white powder, having a feeble odor of thymol. According to Dr. Aufrecht it has the following composition: Formaldehyde, 0.13 per cent.; thymol, 0.1 per cent.; zinc oxide, 34.44 per cent.; starch, 65.27 per cent. Intended as a disinfectant for perspiring feet. It is said to have great disinfecting power, in consequence of splitting off formaldehyde, when brought in contact with wounds and pus formations.—(D. Drog. u. Farbw., through Südd. Ap. Zt.)

NEW SOLVENTS FOR PYROXYLIN.—Alcoholic solutions of various salts have the property of dissolving gun cotton in large quantity without the addition of ether. Such salts are the chlorides of ammonium, calcium, magnesium, aluminum and zinc, the acetates of potassium and ammonium, and lactate of sodium. The risk of fire, explosions, etc., would be much lessened by the use of these solvents. The solutions can also be made by impregnating the cotton with the salt and then dissolving in alcohol. (Ph. Centralh., through Südd. Ap. Ztg.)

PRESERVATION OF EGGS.—Experiments have been made by Director Strauch, of the Agricultural School, in Neisse (Germany), with various methods for keeping eggs fresh. At the beginning of July 20 fresh eggs were treated by each method and examined at the end of February. The results are given below:

Kept in brine: All unfit for use. Not decayed, but unpalatable from being saturated with salt.

	Per cent. spoiled.
Wrapped in paper	80
Kept in a solution of salicylic acid and glycerin	80
Rubbed with salt	70
Packed in bran	70
Coated with paraffin	70
Painted with a solution of salicylic acid and glycerin.	70
Immersed in boiling water 12-15 seconds	50
Treated with a solution of alum	50
Kept in a solution of salicylic acid	50
Coated with soluble glass	40
Coated with collodion	40
Coated with varnish	40
Rubbed with bacon	30
Packed in wood ashes	20
Treated with boric acid and soluble glass	20
Treated with potassium permanganate	20
Coated with vaseline and kept in lime water	All good.
Kept in soluble glass	All very good.

(Südd. Ap. Zt.)

CAPTOL is the name of a condensation product of tannin and chloral, which is recommended for diseases of the hair and scalp. Experiments have shown it to be effective in seborrhœa capitis, the preparation being used in 1 to 2 per cent. alcoholic solution, to the exclusion of soap, pomades and ointments. Captol is a dark brown, hygroscopic powder, slightly soluble in cold water, more soluble in warm water or alcohol, not changed by acids, but decomposed by alkalies with deepening of color. Heated with soda solution and anilin, it gives off a strong odor of iso-nitrile.—(Drog. Zt.)

TO PREVENT RUSTING OF IRON.—A patented process to prevent rusting of wrought or cast iron consists in applying with a brush a strong solution of potassium dichromate and drying in a stove or over an open fire. Drying at ordinary temperature is not sufficient. To ascertain if the heat is strong enough, the iron is moistened with a little water. So long as this takes up any color the heat must be increased. When the proper degree of heat is reached, a fine deep black layer results, which is not acted upon by water, and protects the surface from the action of the atmosphere.—(Ph. Woch.)

COMPOSITION FOR HECTOGRAPH.—The following is recommended: Gelatin, 170 parts; glycerin, 1,410 parts; water, 400 parts. The mixture, after standing some time in the cold, is melted together on a waterbath and poured out with care to prevent formation of air bubbles. Addition of salicylic acid increases its keeping qualities. Before using, it is directed to moisten the surface with water and to remove the excess by spreading paper over it. Old writing is easily removed with a sponge moistened with very dilute hydrochloric acid.—(Ph. Post.)

SANOSE is a new albumen preparation, stated by the manufacturers to consist of 80 per cent. casein and 20 per cent. albumose. It is a white, odorless and tasteless powder, which forms an emulsion with water. To make it more palatable it may be given in milk, cocoa or leguminous soups. Another combination of agreeable taste is with nutrol, which, as is known, contains maltose, isomaltose, dextrin, and a little pepsin and hydrochloric acid. Sanose is easily digested at 40° C. by trypsin or by pepsin and hydrochloric acid. The preparation has given good results in clinical experiments.—(Ph. Wochensch.)

NEW REMEDIES.—Acerdol has been introduced as a new disinfectant. It appears to be nothing more than a mixture of manganate of potassium and free potash. Captol is a condensation product of chloral and tannin. Chloral cyanhydrate, $C_4H_2Cl_3N$ is also a new chloral compound on the market. It forms colorless crystals, melting at 58° —61°, and containing the equivalent of 15 per cent. of hydrocyanic acid. Euphthalmin is a new mydriatic. It is the hydrochloric salt of methyl-vinyl-diacetonalkamine. Iodogallicin, a new antiseptic powder, is the bismuth compound of oxyiodomethyl gallol.—Sudd. Apotheker Zeitung; Br. & Col. Dr.

WINE OF CINCHONA.—The following formula is given by Dr. G. Romijn in "Pharm. Weekblad":

Powdered cinchona bark	10 parts
Hydrochloric acid (146 parts for every 310 parts alkaloids)	
Alcohol	14 parts
Sugar	25 parts
Water, sufficient to make	100 parts

Dissolve 5 parts of sugar in a mixture of the alcohol, two-thirds of the acid, and enough water to make 40 parts, percolate the powder with this menstruum in the usual manner; continue the percolation with a mixture of 20 parts of water and the remaining acid and finish with water. Separate the first 75 parts of percolate, dissolve in it the remainder of sugar, and make up to 100 parts with the succeeding percolate. (Südd. Ap. Ztg.)

QUESTION BOX

The object of this department is to furnish our subscribers and their clerks with reliable and tried formulas and to discuss questions relating to practical pharmacy, prescription work, dispensing difficulties, etc.

Requests for information are not acknowledged by mail and ANONYMOUS COMMUNICATIONS RECEIVE NO ATTENTION; neither do we answer queries in this department from non-subscribers.

Sizing For Crayon-work on Silk.

(J. H. B.) Apply to the surface to be worked upon a very thin solution of bleached shellac in alcohol. Some artists recommend for the same purpose a sizing made from the whites of eggs.

Compound Powder of Acetanilide.

(T. J. S.) To help you out we comply with your request to publish the formula for the above National Formulary preparation. At the same time we cannot refrain from urging you to secure a copy of this most valuable book at once. Do not let it be said that you haven't one of the most useful of books belonging to your profession. Here is the formula:

Acetanilid	50 grams
Caffeine	2 grams
Tartaric acid	3 grams
Sodium bicarbonate	45 grams

Reduce the ingredients separately to a fine powder and mix them thoroughly.

Elixir Lactated Pepsin.

(M. L.) The National Formulary offers a formula for a preparation containing pepsin with lactic acid. See that work page 22 (Compound Digestive Elixir.) Another formula is the following from Griffiths' "Non-Secret Formulas":

Pepsin, pure	80 grains
Pancreatin	40 grains
Diastase or ptyalin	10 grains
Cudbear, powdered	180 grains
Diluted hydrochloric acid	20 minims
Lactic acid	3 drops
Alcohol	3 fl. ounces
Water	5 fl. ounces
Simple syrup	6 fl. ounces

Mix all the above ingredients except the syrup, macerate for 3 days, agitating frequently; filter, to the filtrate add the syrup, and then through the filter add enough of a mixture of alcohol and water, in the proportion of 5 to 7 by measure, to make the liquid measure 16 fluid ounces.

Shampoo Paste.

(Barber.)

(1) Castile soap, white	4 ounces
Curd soap, powder	2 ounces
Potassium carbonate	1 ounce
Honey	1 ounce
Water of ammonia	½ ounce
Oil sassafras	½ fl. dram

Make a homogeneous paste by heating with a sufficient quantity of water.

(2) Water of ammonia	3 fl. drams
Cologne water	3 fl. drams
Alcohol	5 fl. ounces
Water	5. fl. ounces
Whites of egg, as many as desired.	
Oil of sassafras, q. s.	

The whites of egg (about two) are thoroughly beaten up previous to being mixed with the water and water of ammonia; the remaining ingredients are added in their order and the whole stirred briskly.

(3) White castile soap, in shavings	2 ounces
Water of ammonia	2 fl. ounces
Bay rum, or cologne water	1 fl. ounce
Glycerin	1 fl. ounce
Water	12 fl. ounces

Dissolve the soap in the water, by means of heat; when nearly cold, stir in the other ingredients.

Prize Elixir.

(H. J. P. & S.) This formula was published in the Jan. 3, 1895, Era, but as that issue is out of print we repeat it here:

Oil orange (fresh)	96 minims
Oil lemon	24 minims
Oil coriander	6 minims
Tincture vanilla, U. S. P.	2 fl. ounces
Tincture cardamom, simple	2 fl. ounces
Powdered chocolate (Hance's or Baker's)	2 ounces
Alcohol	32 fl. ounces
Syrup, simple	48 fl. ounces
Water (filtered through charcoal) enough to make	1 gallon

Filter and clarify with purified talcum.

(1) Dissolve the oils in 8 fluid ounces alcohol, add 24 fluid ounces water and the balance of the alcohol; shake well.

(2) Dissolve chocolate in 6 ounces hot water, add the syrup, shake well, add the tinctures of cardamom and vanilla, and enough water to make one gallon. Filter through paper, on which about one ounce talcum has been distributed; return the first part until the filtrate is clear.

For additional remarks on the preparation of this elixir see this journal, March 28, 1895, page 398.

Lice on Poultry.

(B. C. B.)—Lice results from uncleanliness. A work on veterinary medicine directs the birds to be washed daily with wormwood boiled in water, and the fowl and coop to be sprinkled with the infusion. Another remedy is to dust into the feathers flowers of sulphur, or sawdust moistened with petroleum ether (benzine), or carbolic acid. The henhouse should be whitewashed with a solution of lime to which a little carbolic acid has been added.

To remove chicken lice from coops try one of the following:

(1) Carbolic acid, crude	1 fl. ounce
Water	15 fl. ounces

Wash the woodwork with this mixture and sprinkle in nests and on floor:

(2) Make the roosts perfectly clean with hot soap and water, and afterward apply spirits of turpentine or kerosene oil. Also strew some sprigs and branches over the floor of the coop. The building should be kept clean.

(3) Crude carbolic acid	6 fl. ounces
Carbon disulfid	5 fl. ounces
Oil tar	2 fl. ounces
Kerosene	1 gallon

Put all in a 2-gallon jug, adding the kerosene last; shake well until thoroughly mixed. Do not cork tight when first put in the jug, or it will burst the jug. After being well mixed, cork tightly. Apply to roosts, walls, etc., with a brush or whisk broom.

Sodium Hyposulphite And Quinine Bisulphate.

(N. B. F.) received this prescription:

Quinine bisulphate	1 dram
Sodium hyposulphite	2½ drams
Glycerine	1 ounce
Cinnamon water, enough to make	4 ounces

Mix. Shake the bottle. One teaspoonful one hour before meals in water.

The first time our correspondent dispensed this prescription he obtained a whitish mixture with a sulphurous odor. Upon refilling the mixture slowly turned a "pinkish color." He delivered it to the patient, but the next day it was returned with the claim that it was not the same kind of medicine he had dispensed before, for it had turned to a dirty slate color. Are color changes likely to take place?

Yes. Sodium hyposulphite is partially decomposed by the sulphuric acid of the quinine salt, sulphur being precipitated, and sulphurous acid gas (SO_2) being liberated. This reaction is characteristic of sodium hyposulphite, and one by which it is distinguished from sulphite and bisulphite of sodium. The appearance of the sulphur formed depends upon the liquid in which the reaction takes place, and it may vary from a lightish yellow to a dirty gray. The prescriber was evidently aware of this reaction, from the fact that he directs the mixture to be sent out bearing a shake label. Sodium hyposulphite is used in certain diseases supposed to be dependent upon a fermentation or zymosis in the blood, and upon this theory it has been quite extensively administered in pyæmia and allied affections.

Tan Shoe Polish.

(H. B.)

(1) Yellow wax	6 ounces
Linseed oil	10 ounces
Spirits of turpentine	30 ounces

Dissolve by means of a water bath in a closed vessel and add soap 4 ounces previously dissolved in 2 pints of water. Stir continually till cold. Then with each ounce of the mixture incorporate 5 grains of Nankin brown dissolved in ½ dram of alcohol. The resulting polish is applied to leather with a rag, allowed to dry, and then lightly polished with a soft duster. For red or green leathers substitute the corresponding anilines (oil-soluble red, malachite green, etc.), for the Nankin brown in the above.

Paste Dressing for Brown Leather.

(2) Oil turpentine	3 ounces
Yellow wax	1 ounce
Palm oil	1 ounce
Oil mirbane	15 minims

Make into a paste. If not of the right shade add a few drops of solution of tincture of catechu.

(3) Yellow wax	4 ounces
Spirit turpentine	8 ounces

Melt on a water-bath, strain, stir occasionally until the paste turns creamy, then add

Nankin brown	15 grains
Phosphine	5 grains
Water	½ ounce

previously dissolved. Stir constantly until the mixture is homogeneous.

Furniture Cream.

(W. H. W.) Here are several formulas for preparations of the character you describe:

(1) Castile soap	1 ounce
Yellow wax	1 pound
White wax	1 ounce
Turpentine	2 pints
Boiling water	2 pints

Melt the waxes on a water-bath and add turpentine, stirring until the mixture is quite liquid. Separately dissolve the soap in the boiling water, and pour the two mixtures simultaneously into a hot earthenware jug or jar. Stir for five minutes, and pour into wide mouthed bottles for sale.

(2) Yellow wax	3½ ounces
Potassium carbonate	160 grains
Oil of turpentine	2½ fl. drams
Oil of lavender	80 minims
Water, a sufficient quantity.	

Boil the wax with 16 fl. ounces of water over a direct fire, and add to the hot liquid the potassium carbonate. Remove the mixture from the fire, add the oils of turpentine and lavender; stir until cool, and add enough water to make 32 fluid ounces.

In using this cream first remove all dirt and grease, apply the polish with a woolen cloth and then rub with a piece of linen until the furniture has acquired a polish.

(3) Beeswax	4½ ounces
Castile soap	½ ounce
Spirits turpentine	½ pint
Boiling water	½ pint

Melt the wax in a covered jar by gentle heat, add the turpentine carefully, and then gradually add the soap, previously dissolved in the water, and stir till stiff.

White Furniture Cream.

(4) White wine vinegar	3 ounces
Raw linseed oil	6 ounces
Butter of antimony	½ ounce
Methylated spirit	6½ ounces

Mix the linseed oil with the vinegar added by degrees, and shake well so as to prevent separation. Add the methylated spirit and butter of antimony and mix thoroughly.

Not the Mercer Chemical Co.

In the Nov. 25 Era, page 785, were published a few remarks, under the heading, "The Physicians' Supply Evil," in connection with which was quoted a circular letter distributed by one of these supply concerns in Omaha, Neb. In regard to this article, the Mercer Chemical Company of that city write us:

"We agree entirely with your remarks in reference to the letter referred to, and are glad you have gone after these people. You have stated the name in an ambiguous way, however, and we find that a number of dealers in the West have taken your article to refer to us. As we are confident you would not willingly do us an injustice, we write to call your attention to the matter, and hope you will set us right."

It was not the Mercer Chemical Company that the article referred to.

Competitive Examinations For Hospital Stewards.

A dispatch from Buffalo states that the government is preparing to put the position of hospital steward in the merit list. A circular has just been issued announcing that regular examinations for the position will be held on Feb. 3 and 4 in all cities having a board of examiners. Only graduates in pharmacy are eligible, and single men or those with small families are preferred. As the salary runs from $480 to $720 a year, and includes subsistence, quarters, fuel and light, there is many a pharmacy college graduate who would jump at it, so that the opening is regarded as a very good one by the pharmacists generally. As there are now no eligibles in the way, and the circular states that there are a number of vacancies, the applicant who is able to pass the examination creditably will run a good chance of an appointment.

New Food For Codfish.

We are averse to joking at the expense of our friends, but the following is too good to keep out of print.

One of the manufacturers whom Commissioner Blackburn has attacked on the ground that his product contains morphine, claims to be perfectly innocent of the charge, and attributes his troubles to the machinations of his enemies. It is said that one of his representatives recently stated that these particular enemies were so desirous of injuring them that they sent an agent to Norway last summer and bribed the people who supply their cod liver oil to put morphine into it.

When this story was told to a certain lawyer who is noted for his ready answers, he replied: "Oh, no! I don't believe it was done in that way! The morphine was probably fed to the codfish."

The Journal, published by the Alumni Association of the Cincinnati College of Pharmacy, calls attention to the meeting of druggists called to discuss the Ohio poison law, and says anent it that "Commissioner Blackburn, O D. and F. Commissioner, has displayed good sense in applying the law to all proprietary preparations containing poison. He merits the co-operation of every loyal pharmacist, and we hope that druggists will seek for themselves the nature of the preparations to which they lend indorsement in offering them for sale. A word to the wise should prove sufficient." Rather significant, when considering its source.

Poison Label on Prescriptions.

Cadillac, Mich., Dec. 6, 1897.

To the Editor.

If it is right to have poison labels on every patent medicine that contains any form of poison and in the minutest infinitesimal doses, then why not compel physicians in their practice and druggists in putting up their (the doctors') prescriptions to label every article of poison that contains it, before delivering it to the patient, even when at the bedside prescribing? If it is good judgment and law one way it must be the other.

DR. JOHN LEESON.

SCIENTIFIC NOTES FROM SCHIMMEL'S REPORT.

CARDAMOM OIL.—The fruits of Elettaria cardamomom yield 2.14 per cent. of a light yellow oil (malabar cardamom oil) of an odor differing but little from that obtained from the commercial Ceylon cardamom distilled from the fruits of Elettaria cardamomom var. b. It is said that the former oil cannot compete with the commercial variety as it is much higher in price. Its specific gravity is 0.943, its optical rotation + 34° 52′ at 19° C. It is soluble in 4 and more parts of 70 per cent. alcohol. When saponified by alcoholic potassa solution its factor of saponification was found to be 132, indicating a much higher amount of ester. The acid constituent of the ester is acetic-acid forming, when separated by well-known methods. No formic acid, nor any of the higher fatty acids seem to be contained in the oil. When saponified and submitted to fractional distillation in a vacuum, two fractions were obtained, the first having a strong odor of cineol, and formed a crystalline separation with iodol. Upon recrystallization from its solution in petroleum ether cineoliodol was obtained.

The fraction obtained between 150° and 164° at 14 mm. pressure solidified, when placed into a freezing mixture. After repeated liquefaction and allowing the mixture to slowly resolidify, crystals were obtained melting at 35° to 37°. These crystals were found to be an optically strong active modification of terpineol; the angle of opt. rot. was found to be + 83° 31′ at 21° C. The amount of dextrogyre terpineol contained in the oil of Malabar cardamom is only very small.

The oil distilled from the seeds of amomum cardamomom S., which from time to time turn up in the London market under the name of "camphor seeds" (so called from their camphor-like odor), is semi-solid at ordinary temperatures, and has a distinct odor of camphor and borneol. To liquefy the crystalline part of the oil it was warmed to 42° C.; it then had a sp. gr. of 0.905 and an opt. rot. of + 38° 4′. Its saponification factor is 18.8, and after acetylization the factor was raised to 77.2, corresponding to 22.5 per cent. of borneol in the original oil. The oil is soluble in 1.2 volumes of 80 per cent. alcohol.

CARDAMOM OIL, KAMEROON is derived from Amomum Danielli, Hooker. The yield of oil is 2.33 per cent.; sp. gr. 0.907; opt. rot. —20° 34′ and it is soluble in 7 to 8 parts of 80 per cent. alcohol.

GRAINS OF PARADISE OIL is obtained from the seeds of Amomum Melagueta, Roscoe; the yield is about 0.75 per cent. of distilled oil, having an aromatic odor, a sp. gr. of 0.894; opt. rot. —3° 58′; it is soluble in 10 to 11 parts of 90 per cent. alcohol.

CEDARWOOD OIL. The common source of this oil seems to be derived from the waste of lead pencil factories. It is said that if this source should once be cut short, and the necessity arise to employ wood in blocks for distillation, the price of the oil would rise to 4 to 6 times its present rate. A study of the chemical composition of cedarwood oil showed that the hydrocarbon of the oil, cedrene, when rectified by distillation from sodium boils at 131° to 132° C. at a pressure of 10 mm.; has the sp. opt. rot. —47° 54′, and is a sesquiterpene. The efforts to obtain the number of double linkings formed by the addition of chlorine—or bromine-hydrogen failed, on account of the want of stability of the addition products. Cedrene, when oxidized under proper conditions in an acetic acid solution by means of chromic acid forms a liquid ketone, cedrone, $C_{15}H_{24}O$, which boils at 147° to 151° at a pressure of 7.5 mm. With hydroxylamine an oxime is obtained, which boils at 175° to 180°; this product when treated with acetic anhydrid gives an acetate, $C_{17}H_{27}O_2N$, which boils at 185° to 190° at 9 mm. pressure.

When the ketone is reduced by an ethereal solution of sodium, a liquid alcohol, isocedrol, $C_{15}H_{26}O$, is formed, which boils at 148° to 151° at 7 mm. pressure and whose benzoic-acid ester boils at 221° to 223° under 6 mm. pressure. When cedrene is subjected to an energetic oxidation by a mixture of chromic and sulfuric acids, a semi-fluid acid results. When treated with sulfuric acid and glacial acetic acid, cedrene is not hydrated. Cedar camphor or cedrol is isomerous with isocedrol. When cedrol is heated to 100° with acetic anhydride in a sealed tube, part of it is converted into acetic acid ester, while another part is resolved into sesquiterpene with the elimination of the elements of water. When acted upon by benzoyl-chloride, no ester but the hydrocarbon $C_{15}H_{24}$ is formed. Upon oxidation neither a ketone nor an aldehyde are formed from cedrol; it, therefore, seems to be a tertiary alcohol.

GUAIACUM-WOOD OIL, sometimes erroneously called Champaca-wood oil, is obtained from the South American guaiac tree, which has nothing in common with the champaca tree (Michelia champaca L.) In the congealed condition this oil is used for scenting soaps, but the presence of the crystalline part makes it less adapted for preparing fine extracts. In order to overcome this difficulty a modification of the oil, remaining fluid at common temperatures by removing as far as possible the crystalline constituents, has been prepared. The crystalline part of the oil is an alcohol called guaiol, which, when pure, is odorless. The liquid guaiac oil should be kept in a moderately warm place during the winter months, otherwise slight crystallization might take place. A complete removal of the solid constituent would increase the price of the oil, without offering any practical advantage.

MYRRH OIL.—W. Tucholka has extracted an essential oil from a sample of gum myrrh coming from the interior of the Somali. His method consisted in removing the essential oil from the alcoholic solution of the gum by shaking it with a petroleum ether of a low boiling point; after the evaporation of the petroleum ether the oil was distilled by steam. The oil has a light yellow color and a characteristic odor. When dried over calcium chloride its sp. gr. is 0.8836, and boils at 220° to 270°. The yield of oil was 7.8 per cent. When hydrochloric acid gas is passed into the ether solution of the previously dried oil, 6.5% of a hydrochloride are obtained, which, after the removal of the ether, separates in crystals when the solution is exposed to a freezing mixture. These crystals are purified by recrystallization, first from an alcoholic and subsequently from an ether solution; they melt at 79.3° and are optically inactive. By boiling with sodium acetate in a solution of acetic acid, hydrochloric acid is set free and a hydrocarbon is formed, which boils at 259° to 260.2° and which has the specific gravity of 0.8914 and the angle of refraction of 1.4608. As this hydrocarbon is not identical with any of the terpenes thus far known, Tucholka calls it bisabolene.

STAR ANISE OIL.—A description of the distillation of star anise oil has recently been published in Decennial Reports (1882-1891) of the trade, navigation, industries, etc., of the ports open to foreign commerce in China and Corea, and from them the following abstract is taken:

"The Lungshow star-anise is considered better than that produced in the Po-sê district, and yields more oil. The trees, originally wild, but now frequently cultivated, grow on hillsides, where the sloping ground prevents water from standing around the roots, yet retains enough moisture as the rain runs down from the higher ground above. The trees are very liable to injury from smoke, and as the common habit in clearing fields is to burn the grass and débris, the neighborhood of villages is avoided in selecting a place to plant, and the dry grass beneath the trees is cut and carried off yearly, to prevent the spread of accidental fires. Young trees bear seed suitable for commercial purposes after 10 years, and trees 100 years old still bear. The yield of the same tree varies much from year to year, and trees that produce every year are rare. They flower at the beginning of February, and the anise-seed is gathered in August and September. Fresh anise-seed is worth, ordinarily $5.50 per picul, and a picul dries down to 20 or 25 catties.

"The oil is extracted from fresh anise-seed by distillation. Steam passes through a wooden cylinder containing the anise-seed, placed over the boiler, into an earthenware jar, where it is condensed by cold water placed in a pan on the top. The condensed mixture of water and oil flows through a pipe into a tin-lined box of two compartments, in the partition between which is a hole near the top. The oil floating on the top of the water is drawn off through this hole into the other compartment. The process takes several days.

"A picul of fresh anise-seed yields 3 catties of oil (=3 per cent.), and a picul of oil is worth from $180.— to $190.—. For transport, it is packed in tins of 32 to 35 catties weight, and sent overland to Hongkong."

SAVORY OIL.—From the fresh blooming plant of summer savory, Satureja hortensis L., 0.097 per cent. of an oil were obtained. The oil contains 38 per cent. of phenol (carvacrol), has a specific gravity of 0.904 and has an opt. rot. of + 0° 4′; it requires 9 parts of 80 per cent. alcohol for solution. The composition of savory oil as ascertained by Jahns consists of carvacrol, phenol, cymol and a terpene not yet examined. The odor of the oil is pleasantly aromatic.

PETIT GRAIN OIL.—The main constituents are limonene, linalool, linalyl acetate and a sesquiterpene. Passy recently ascertained that the oil contains, besides the constituents named, quite an amount of geraniol, partly free, partly in the form of an acetic ester. He believes that geraniol and its acetic ester are one of the factors in the fragrance of petit grain oil; there are, however, still other oxygenated constituents contained in the oil which exercise some influence upon its odor and which call for further investigation.

PINE NEEDLE OILS.—Three installments of the distillates of American pine needles have been examined. 1. Fir oil, distilled from the needles of Pinus sylvestrus L., having a sp. gr. of 0.884, opt. rot. —24° 8′ at 18° C. Soluble with slight turbidity in 8 volumes of 90 per cent. alcohol. The oil undoubtedly contains bornyl acetate; when calculated by the factor of saponification (34.8) the amount of bornyl acetate is 12.1 per cent. A remarkable feature is the laevogyrate rotation corresponding to that of English oil. Both German and Swedish oils are dextrogyrate. 2. Hemlock oil, distilled from the needles of Abies Canadensis L. sp. gr. 0.911, opt. rot. —25° 22′ at 16° C. Contains 38 per cent. of bornyl acetate, and is soluble in one volume of 90 per cent. alcohol. 3. Spruce oil, distilled from the needles of Picea nigra L. sp. gr. 0.913, opt. rot. —23° 50′ at 18° C. Contains 38.1 per cent of bornyl acetate, and is soluble in one-half part by volume of 90 per cent. alcohol, with 5 parts by volume the solution is strongly opalescent.

The Wisconsin Board of Pharmacy does not waste any sympathy on violators of the pharmacy law, but gets after them with a sharp stick. It has just secured the conviction, with fine and costs, of the proprietors of a large department store at Menomonee Falls for selling drugs and poisons with no pharmacist in charge of the store, and of a firm of general dealers in the same town for selling carbolic acid, no pharmacist being in the store and the poison not being labeled. This is the sort of work to create a little respect for the law. There cannot be too much of it.

——C. A. Devendorf, a druggist at Jackson Boulevard and Ogden avenue, is one of the many druggists in Chicago who believe in enjoying themselves each fall. With a party of five or six he has gone to Canada and will spend a month in the healthy sport of deer hunting. They will hunt in the region of Georgian Bay.

The Era Course in Pharmacy

J. H. BEAL, Sc.D., Ph.G., Director.

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THE ERA COURSE IN PHARMACY is a thorough, practical and economical course of home study in pharmacy, and covers the subjects usually embraced in the curriculum in a standard college of pharmacy. It is designed for all who desire systematic instruction in pharmacy; for clerks who cannot attend college; for those preparing for pharmacy board examinations; as auxiliary course for students in college, and as a means of review for graduates and experienced pharmacists.

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FEES. The entire expense is only $7.75 per annum and includes subscription to the ERA, tuition fees and a binder for preserving copies and lectures.

LECTURE NO. 31.

Inorganic Chemistry.

Arsenic. Antimony. Bismuth.

COMPOUNDS OF ANTIMONY.

Hydrogen Compounds.—When hydrogen is evolved in contact with a compound of antimony it combines with the latter to form antimony hydrid, or stibin, SbH_3. Stibin is an instable gas, possessing a disagreeable odor, burns in the air with a grayish white flame, forming white clouds of antimonous oxid, and is decomposed when passed through alkaline or acid solutions. Passed into a solution of silver nitrate, silver antimonid, $SbAg_3$, is precipitated. When a cold surface, as porcelain, is held in the flame of stibin, or when the gas is passed through a red hot tube, a brilliant mirror of metallic antimony is formed resembling the deposits in the Marsh tests for arsenic, but is usually less lustrous and may be distinguished from the arsenic spot by its turning white without dissolving when treated with nitric acid.

Halogen Compounds.—Antimony forms one or more compounds with each of the halogens. With chlorin it forms the trichlorid, $SbCl_3$, and the pentachlorid, $SbCl_5$.

The *trichlorid* is formed when antimony or its oxid is dissolved in hydrochloric acid, or when distilled with some volatile chlorid. It is a colorless, crystalline, very delinquescent substance. It is commonly seen in the form of an impure solution known as "liquid butter of antimony," and used as a caustic application in veterinary practice.

When an acid solution of the trichlorid is diluted with water, the compound is decomposed and part of the antimony precipitated as a basic or oxy-chlorid.

$$SbCl_3 + H_2O = SbOCl + 2HCl.$$

The composition of the compound varies with the degree of dilution, temperature, etc. When it has the composition SbOCl it is known as Powder of Algaroth, from its having been used as a medicine by the physician Algarotus, near the end of the sixteenth century.

The pentachlorid, $SbCl_5$, is formed by the direct combination of antimony and chlorin, the union being accompanied by the evolution of light and heat. It is a colorless, volatile, fuming liquid, decomposed by heat, and also yielding basic precipitates when diluted with water.

With bromin antimony forms a tribromid, with iodin a tri-iodid, and with fluorin a tri- and pentafluorid. These resemble the chlorids in their general properties and are of but small practical importance.

Oxygen Compounds.—Antimony forms three oxids, the trioxid, Sb_2O_3, or Sb_4O_6, the tetroxid, Sb_2O_4, and the pentoxid, Sb_2O_5.

The trioxid occurs native, and can be obtained artificially by roasting the sulfid in the air, by oxidizing the metal with nitric acid, or by treating the precipitated oxychlorid with an alkali to remove the remaining chlorin.

It is soluble in acids, to form the antimonous salts, and is used to some extent in medicine. Dissolved in potassium bitartrate it forms the well-known Tartar Emetic, $KSbOC_4H_4O_6$. The other oxids are unimportant.

Sulfur Compounds.—Antimony forms a number of compounds with sulfur, only two of which need consideration. Antimonous sulfid, Sb_2S_3, is the principal ore of the element, and is found in crystalline, steel gray masses. When hydrogen sulfid is passed into a solution of an antimonous salt the amorphous trisulfid is precipitated, orange red, and soluble in solutions of the alkaline sulfids, from which it is reprecipitated by acids. When a solution in an alkaline hydroxid is treated with dilute sulfuric acid, the resulting precipitate consisting of antimonous sulfid mixed with a small amount of the oxid and constitutes the *sulfurated antimony* or the *Kermes mineral* of the Pharmacopœia. Antimonic sulfid, Sb_2S_5, is formed in a similar way and has similar properties.

Potassium-Antimonyl Tartrate.—When antimonous oxid is boiled with a solution of potassium bitartrate, the remaining hydrogen atom of the latter is replaced by the radical Antimonyl SbO, and potassium antimonyl tartrate, $KSbOC_4H_4O_6$, is formed, popularly known as Tartar Emetic.

Properties and Uses of Antimony Compounds.—The principal uses of the antimony compounds are found in medicine, the oxid, sulfid, and tartar emetic being the compounds commonly used. In small doses they are diaphoretic and alterative, in larger doses emetic. Their poisonous action in general resembles that of arsenic, but is usually not fatal, on account of the rejection of the substance by the emetic effect produced.

The amorphous sulfid is used as the vulcanizing agent in the manufacture of the red or brownish red rubber goods.

Characteristic Reactions.—Many reactions of antimony resemble those of arsenic, from which it is, nevertheless, in general easily discriminated. Heated on charcoal before the blow-pipe, solid antimony compounds yield white clouds of the oxid, with a white incrustation on the charcoal, and the production of a bead of metallic antimony, but without the garlic odor produced by arsenic when similarly treated. When an antimony compound is added to a piece of bright copper foil in dilute hydrochloric acid and heated, a steel gray deposit of antimony is formed on the copper. This is distinguished from the similar deposit of arsenic by drying the foil and heating in a dry test tube, when the sublimate will be amorphous and not crystalline like that of arsenic.

Solutions of antimony compounds, not too strongly acid, will produce white precipitates of basic salt when poured slowly into a large excess of water.

Hydrogen sulfid passed into solutions of antimonous salts precipitates the orange red sulfid, soluble in alkaline hydroxids and sulfids.

PRACTICAL STUDIES.

1. Place some dry antimonous oxid in a small cavity on charcoal and heat before the blow-pipe. How does the result compare with the corresponding experiment under arsenic? Is there odor, incrustation or metallic bead?

2. Dissolve some oxid of antimony in hydrochloric acid with the aid of heat, using no more acid than is necessary. What is probably formed in solution? Add a few drops of the solution to a test tube full of water. What occurs? Write an equation representing the reaction.

3. Dilute the solution of antimonous chlorid, (a precipitate if it forms does not interfere) and pass in hydrogen sulfid, or add a small amount of ammonium sulfid, diluted with ammonia water. What takes place? Write an equation.

4. Pour off the liquid from the last precipitate, rinse with water, and add sufficient yellow ammonium sulfid to cover. If necessary, warm gently, and note the result.

5. To the clear solution obtained in the last experiment add dilute sulfuric acid, drop by drop, and note the result.

6. Place a strip of copper foil in a test tube with some dilute hydrochloric acid and heat. If arsenic is absent, the foil should become bright. Now add a few drops of any solution containing antimony and continue the heating. Compare the result with the corresponding experiment under arsenic.

BISMUTH.

Symbol Bi. Atomic Weight 208.9. Valence 3, 5. Specific Gravity 9.823.

Historical.—Bismuth seems to have been first distinctly pointed out as a separate metal by Basil Valentine in his "Last Testament," published in the fifteenth century. By the later alchemists it was frequently confounded with antimony and also with zinc, and it was not until 1739 that the metal was carefully studied and described by Pott. The name is probably derived from the German "wismuth," applied by the miners to the native metal.

Natural Occurrence.—Bismuth occurs mainly in the free state, but is found also as the oxid, and sulfid, and to some extent combined with tellurium, copper and lead. The principal sources are Australia, South America and Europe.

Preparation.—Where is occurs in the free state it is separated from the earth impurities by simple fusion, and pouring off from the infusible matter. Its ores may be reduced by roasting and heating with carbon, as in the reduction of antimony. Nearly all commercial bismuth contains arsenic, from which it must be freed before it can be used pharmaceutically.

Description and Physical Properties.—Bismuth is a hard, brittle, white metal, with a brilliant luster and a distinct pinkish tinge. Its specific gravity is 9.823. It fuses at 270°, and can be distilled at high temperatures. Its crystalline form is that of an obtuse rhombohedron, resembling a cube.

Chemical Properties.—Its luster is permanent in perfectly dry air, but in the presence of moisture it slowly becomes covered with a thin film of oxid. It does not decompose water at ordinary temperatures, but does decompose steam at red heat. It is insoluble in hydrochloric and in cold sulfuric acids. Hot sulfuric acid dissolves it with evolution of sulfur dioxid. It is readily soluble in both nitric and nitro-hydrochloric acids.

COMPOUNDS OF BISMUTH.

Alloys.—Like antimony, bismuth expands at the moment of solidification, thus enabling a sharp impression of the mold to be taken. It is used in the manufacture of stereotype metal, and in the production of fusible alloys. One of the latter, known as Wood's metal, consisting of bismuth 4, lead 2, tin and cadmium each 1 part, fuses at 60.5°, a point much lower than the melting point of its most fusible constituent.

Halogen Compounds.—The halogen compounds of bismuth are instable in the presence of water, decomposing like the corresponding antimony salts to form basic compounds.

Oxygen Compounds.—Bismuth forms four oxids, the monoxid, BiO, tri-oxid, Bi_2O_3, tetroxid, Bi_2O_4, and pentoxid, Bi_2O_5.

The trioxid corresponds to the bismuthous salts. It is found native as bismuth ochre, and is produced artificially by heating the hydroxid, carbonate or nitrate, or by burning the metal at a high red heat. The other oxids are unimportant.

Sulfur Compounds.—The principal compound of bismuth with sulfur is the trisulfid, Bi_2S_3. It exists native as bismuthite, and may be produced artificially by fusing bismuth with sulfur, or by precipitating its salts with hydrogen sulfid. When formed in the latter manner it is a brown-black powder, insoluble in alkalies or alkaline sulfids, soluble in nitric acid.

Other Important Compounds.—Other bismuth compounds of importance are the trinitrate, the basic nitrate, and the basic carbonate.

The Trinitrate, $Bi(NO_3)_3$, is obtained when the metal or the hydroxid or carbonate is dissolved in nitric acid. If this solution is poured into an excess of water the basic nitrate, or *subnitrate*, is precipitated. The composition varies with the degree of acidulation, probably the most common composition being $BiONO_3H_2O$.

Bismuth Subcarbonate, $Bi_2O_2CO_3$, is precipitated from bismuthous solutions by soluble carbonates. The subnitrate and subcarbonate are both official.

Uses of Bismuth Compounds.—Bismuth trioxid may be used instead of lead to make a glass of higher refractive index than flint glass. Either the oxid or subnitrate may be used to give an iridescent colorless glaze for porcelain. Compounded with various preparations of gold it yields various colored glazes, ranging from violet-red to copper color, with gold-like luster.

The subnitrate and subcarbonate are also used as cosmetics. Both salts are much used internally as gastric sedatives. When used for this purpose they should be entirely free from arsenic, to the presence of which impurity the occasional untoward effects of bismuth salts have generally been attributed.

Characteristic Reactions.—Solid bismuth compounds on charcoal with sodium carbonate before the blow-pipe yield brittle globules of metallic bismuth, surrounded by an incrustation which is brown yellow while hot and lemon yellow when cold. The outer edge of the incrustation is encircled by a bluish white border.

Solutions of bismuth salts, not too acid, yield white precipitates of basic salt when added to an excess of water. With hydrogen sulfid and alkaline sulfids brownish black bismuth sulfid is formed, not soluble in excess. Alkaline hydroxids precipitate white bismuthous hydroxid, $Bi(OH)_3$, not soluble in excess. In slightly acidulated solutions, potassium iodid precipitates brown bismuthous iodid, soluble in excess of the reagent. Mixed with sulfur and potassium iodid, and heated on charcoal, bismuth compounds yield a scarlet incrustation of bismuthous iodid.

PRACTICAL STUDIES.

1. Mix bismuth subnitrate or subcarbonate with an equal quantity of sodium carbonate and heat on charcoal before the blow-pipe. If a metallic bead is produced, is it soft and malleable or hard and brittle? Is there an incrustation? Does the color change on cooling?

2. Mix equal proportions of a solid bismuth compound, sulfur and powdered potassium iodid and heat on charcoal before the blow-pipe. What is the result?

3. Dissolve some subcarbonate or subnitrate in nitric or hydrochloric acid, using *no more acid than is necessary*. What is the reaction, and what is probably produced? Add a few drops of the clear solution to a test tube full of water, and note result. Represent by means of an equation.

4. Dilute some of the acid solution (a precipitate, if produced, does not interfere with the result) and add either hydrogen sulfid or ammonium sulfid, diluted with ammonia water. What takes place? Write the equation.

5. To a fresh portion of the dilute solution add ammonium or potassium hydroxid solution. What occurs? Write the equation.

6. To another portion of the dilute solution add potassium iodid solution. If a precipitate is formed, note its color. Pour off the supernatant liquid, and to a small portion of the precipitate add more potassium iodid. Is it soluble or insoluble in the excess?

REVIEW OF THE NITROGEN GROUP.

As in the two groups previously studied we have noticed in the present one a marked relation existing between the properties of the elements and their atomic weights. Nitrogen with the lowest atomic weight has the lowest specific gravity, and is distinctly a non-metal. In phosphorus there is an increase in specific gravity, while the element is in some respects less non-metallic than nitrogen. Arsenic, which stands at the middle of the group, stands also on the boundary line between the metals and non-metals, partaking almost equally of the characters of both. Antimony, with a higher atomic weight, has also a higher specific gravity, and is distinctly a metal, although of feeble basic powers, and exhibiting a marked tendency to assume an acid character toward the stronger bases. The last member, bismuth, along with its high atomic weight possesses the highest specific gravity in the group, and is a very pronounced metal, its most marked resemblance to non-metallic qualities being the ready decomposability of its halogen compounds by water.

A comparison of the hydrogen compounds of the group is also instructive. Beginning with ammonia we have a very strong and stable base. Phosphin is less basic, and less stable, arsin still less so, and stibin least of all, while bismuth does not even form a compound with hydrogen.

* * *

INTRODUCTION TO THE STUDY OF BOTANY, PHARMACOGNOSY AND MATERIA MEDICA.

According to the plan of study previously marked out, the lectures upon Pharmaceutical Physics are to be followed by the subjects of Botany, Microscopy and Pharmacognosy in such order as to lead the student easily and naturally to the important and somewhat difficult subject of Materia Medica.

It is with especial pleasure that we are able to present as a fitting introduction to these studies the lecture of Prof. H. H. Rusby, delivered to a class of medical students at the Bellevue Hospital Medical College.

In this lecture Professor Rusby has not only succeeded in presenting in a clear light the scope of Materia Medica as it should be studied by the medical student, but has in an admirable manner set forth the reciprocal rights and duties of the physician and pharmacist, and of the necessary limitations upon the province of each.

The arguments in favor of the complete separation of the function of pharmacist and physician are especially valuable in that they are not based upon the requirements of an artificial ethical code, or upon professional sentiment, but upon the moral and physical inability of the same individual to properly serve the public in both capacities. Such arguments will stand because they are founded upon a fundamental truth that must ultimately be generally recognized.

Coming from such a teacher and from such an institution the sentiments here expressed have a peculiar and especial value, and tend to justify the hopes of those who look for better days in both professions.

J. H. B.

LECTURE No. 32.

Materia Medica.

How Its Study Concerns the Physician and Pharmacist Respectively.

By PROF. H. H. RUSBY, M. D.

(Introductory Lecture addressed to the students of the Bellevue Hospital Medical College.)

By the term "Materia Medica" you are to understand all materials used in the treatment of disease, including even such things as surgical instruments and appliances. The Materia Medica is therefore a collection of objects or articles and not a study. We can study these articles by investigating their properties, but this study is not a science like physics, botany or chemistry. In examining these articles, however, we are obliged to make use of all these and other sciences. The important point to be borne in mind is that in studying the Materia Medica our subject of thought is the classification of material things and their properties, and that disease and its treatment, if included in our thoughts at all, are only so in the sense of ultimate objects.

By the term "Therapeutics" you will understand the use of these materials in the treatment of disease. Therapeutics is therefore an art which we can learn to practice; something which we perform. Its performance involves a great deal of skill as well as a great deal of knowledge—among other things of the properties of the Materia Medica. The important point to be here borne in mind is that when we are studying Therapeutics, the subject of our thoughts is the classification and specialization of disease-conditions and that the consideration of the Materia Medica is at this time only incidental, in our search for such agents as we require. These agents we now select on the basis of our classified knowledge, previously gained, of the Materia Medica.

The study of Therapeutics, on the basis of a previous study of the Materia Medica, is Pharmacology. The meaning of this term has been disguised under many definitions, but all which are logical when analyzed resolve themselves into the ideas here expressed.

Up to the present time the custom has been almost general in medical colleges and in medical text-books to treat these two subjects as a single department. The inconvenience of this method and the waste of effort which it involves on the part of both teacher and student have long been apparent. There is however something even worse, namely, a failure to discriminate clearly between the very different nature of the two lines of work.

Referring now to our course in Materia Medica, let us enumerate the subjects which might, and indicate which among them should command our attention. We have

(1)The natural source or origin of the drug, that is, the species of plant, animal or chemical yielding it, as well as its precise relation to that source. For example, the definition of Pulsatilla says "The herb of Anemone Pulsatilla and of Anemone pratensis." Besides this we must note any change in the nature of the article which is necessarily made in transforming it into the condition of the drug. For example, the definition of Pulsatilla goes on to say "collected soon after flowering, carefully preserved and kept not longer than one year."

(2) Any special conditions under which the drug is collected, prepared, preserved, transported and traded in, which affect its quality and make it necessary to exercise care and judgment in prescribing it. When, for example, we are acquainted with the conditions under which ipecac grows and is collected, preserved, packed and marketed, we understand that it is peculiarly liable to consist in large part of the stems of the plant, and also that it is very apt to reach the pharmacist in a moldy condition.

(3) Any impurities to which the drug is liable. This applies more particularly to the inorganic or mineral drugs, but our knowledge even of such substances as opium and elaterium is not carried to a practical point until we understand the dangers of their containing considerable amounts of certain impurities.

(4) A familiarity with the drug by which its identity and quality may be determined upon an examination of it.

(5) The composition of the drug as regards its essential and non-essential, or even objectionable, constituents, their normal percentage and its limits of variation, with the conditions of such variation, the solubility, stability or instability and other characteristics of the constituents, a knowledge of which must govern the methods of manufacture of the preparations and the menstrua to be employed, as well as determine the physician's choice among the different preparations of the same drug which may be offered to him. As illustrations of the classes of facts covered in this article, I may instance the following: The desirable constituent of nux vomica is strychnine, which is insoluble in water, but soluble in alcohol, while the reverse is true of certain of its inert constituents, which we do not desire. This determines us upon employing a strongly alcoholic menstruum for its extraction. The important constituent of cinchona is quinine and we should appreciate that its percentage varies, in the extreme, between 2 and 12 per cent. of the weight of the bark, the different grades of bark requiring special knowledge to identify, and rendering an assay test the most practicable one which we can employ. The several jaborandi leaves and strophanthus seeds of commerce vary almost equally, but we have no practicable assay test and their quality must be determined from their physical examination. The active constituents of belladonna and digitalis are chemically very unstable, very readily decomposing and changing unless the conditions of preservation and manufacture are carefully regulated.

(6) The action of the drug as a whole and of each of its constituents upon each of the human organs or their functions, upon which facts, in Therapeutics, we base our selection both of the drug and its preparation, and upon which we decide which articles should or should not be combined in the preparation of the prescription.

(7) The behavior of these constituents when brought into company with other substances in the prescription. In a preparation of nux vomica it is highly important that the strychnine be present in equal proportion in all parts, so that all doses shall produce equal effects; but there are many substances which we might be apt to mix with nux vomica in a prescription which would cause its strychnine to collect at the bottom of the mixture and to poison our patient when he came to take the final doses.

(8) The actual performance of the processes involved in manufacturing medicinal preparations from drugs and in preparing these preparations for administration, that is, dispensing.

(9) Any poisonous or other untoward effects which the drug may produce and their preventive or curative treatment.

(10) Running all through this study of special subjects we have the history of the introduction, investigation and employment of the drug.

Having reached this point, our study of the material is complete and that of the patient begins. In other words, our study of the Materia Medica has prepared us for the practice of Therapeutics.

Having thus distinguished between the two branches and determined the limitations of that which we are to follow, we next note that its field is entirely too large to be covered by the medical student or physician, in view of the present extensive demands upon his time and attention. In a previous generation, with the boundaries of medical science far more circumscribed, the province of Pharmacy was not recognized by the physician, and both prescribing and dispensing were regarded as his legitimate work. At present these ideas are greatly modified; yet it must be stated that physicians as a class take a radically wrong view of their relations to pharmacy and pharmacists, and to their patients, in regard to this matter. The question whether they should or should not engage in pharmaceutical work is generally regarded as one wholly between the pharmacist and themselves, and to be decided in accordance with the respective rights, privileges and interests of the two classes. It is rather unusual to find one, even among the better class of physicians, who appreciates the fact that the studies and training of the physician do not at all fit him for engaging in pharmaceutical work and that he should therefore refrain from it on the ground of incompetency and out of regard for his obligation to the patient. That this wrong idea is so general is evidenced by the persistence with which the medical profession defends those laws in the different States which authorize him to engage in the practice of pharmacy upon the ground of his medical diploma alone. The corresponding fault upon the part of the pharmacist, that of counter prescribing, need not now concern us. We must keep our own house clean without regard to other considerations. Having taught Materia Medica from a pharmaceutical standpoint for many years, during which time I have exerted my utmost influence in inducing pharmacists to limit themselves strictly to pharmaceutical work, it is with a peculiar pleasure that I now find myself in a position to lead you to a proper view of your duties in relation to these principles. Among the other good results which I hope will flow from your studies in this department, is this, that you will go out to your various fields of labor resolved to do what you can to restrict the practice of pharmacy, as well as that of medicine, to the properly qualified class.

We shall next endeavor to separate our Materia Medica topics into two classes, concerning respectively the two professions. Those of importance for us, taken in the order of such importance, are as follows:

1. The physiological properties of the drug and its constituents as constituting the basis of our choice of a remedy or combination of them, this subject including also their toxicology.

2. Physical and chemical compatibility and incompatibility as permitting or contraindicating such combination.

3. The menstrua used in manufacturing the different preparations of a given drug, thus enabling us to know the several relations of these preparations to the respective drug as regards both the kind of property and the strength.

4. The recognition of all medicinal preparations upon examination.

5. A theoretical knowledge of the variability in quality, purity and strength of the drug from which the medicine is prepared, as enabling us to give proper directions to the pharmacist concerning his supply. In connection with this a certain degree (the higher the better) of ability to determine whether the pharmacist has properly served us, by judging of the quality of what he has dispensed, upon its examination.

6. Such a knowledge of the history of our subject as a professional man of culture desires, for its own sake, to possess.

When we consider the nature of the subjects just enumerated and of their relations to the prescription, it seems strange that any argument should be called for to show their importance in a course of medical study. In fact, however, the reaction from a former system, which forced the entire subject of pharmaceutical work upon the attention of the physician and the medical student, has carried us to the other extreme, wherein many of our best teachers fail to appreciate, or at least to act in accordance with, the natural relations of certain parts of Materia Medica study to medical practice. The bad results of this defect in medical teaching need not be sought, for they are simply scandalous. It is impossible for pharmacists to regard with respect an educational system which results in the seriously erroneous prescriptions which daily reach them. Thousands of physicians recognize their ignorance in this direction and escape responsibility by prescribing nostrums and other ready-made substances, to the disgrace of their profession. The teacher of Therapeutics is not to blame for the defect, because he cannot teach Materia Medica as a part of Therapeutics much more successfully than he can walk eastward and westward at the same time. The bad results referred to are directly due to the almost complete neglect of Materia Medica proper as a branch of medical study.

The method which we shall adopt in studying the several subjects enumerated is as follows: You will receive one lecture a week for two successive years, in which the principles of the subject will be taught. In this course, natural vegetable substances will be classified on the basis of their botanical relationship, without any attempt to teach the botany of the subject as a study. Inorganic and artificial organic substances will be classified on the basis of their chemical relationships. Animal drugs will be classified upon a physiological basis. During the same period the class, divided into small sections, will receive one laboratory lesson a week. At these lessons you will have an opportunity of seeing all the drugs from which our medicines are prepared, though no emphasis is laid upon the importance of this portion of the work. More important for you will be the opportunity of examining the principal medicinal preparations and of learning to recognize them by appearance, odor and taste. Those which are especially liable to imperfections will be more particularly studied. The important principles involved in the making of these preparations will be considered and the processes will be illustrated. The effects of the more common and serious errors in prescription combination will be illustrated by experiments.

Those subjects, upon the other hand, which are not requisite for us, although they are so for the pharmacist, are a familiarity with crude drugs as to their identification, estimation and selection, that is pharmacognosy; their manipulation in the pharmacy; the manufacture of preparations from them; practical dispensing. In other words, while a certain amount of scientific knowledge of the Materia Medica is indispensable to the physician, its arts are in general foreign to his work, just as the arts of diagnosis and therapeutics are foreign to the work of the pharmacist, while some knowledge of their science is of great value to him. The sense of this whole question can be summed up by saying, "Let the physician shun dispensing and the pharmacist prescribing."

I can hardly pass this subject by without saying something to you concerning the present status of the pharmaceutical profession, as it is a matter which is lamentably misunderstood by physicians, this misunderstanding being responsible for a great many failures to accomplish the best results in medical practice. Many years of observation have made clear the fact that the pharmaceutical profession of this country is becoming more and more reliable, both in intent and in ability. It is of course true that pharmacists are not yet quite what they should be. A very large number of them have merely graduated from their apprenticeship and are devoid of scientific training and instruction, and these should of course be shunned. Pharmacists have moreover been spoiled in some directions by the almost universal habit of physicians of prescribing, bringing into prominence and creating a demand for patent medicines and other nostrums. This demand the pharmacist, at first compelled to meet, afterward easily falls into the habit of encouraging, as the trade is highly profitable. There are evils of counter-prescribing and of substitution, genuine and so-called. But the better class of modern pharmacists, educated in our higher institutions, are not less learned, scientific, skilful and ethical than the better class of physicians, and you will find it of the greatest benefit both to yourselves and to your patients to leave pharmaceutical work largely in their hands. Intelligent supervision, it is true, is always desirable, and the more knowledge of his own duties that the pharmacist observes you to possess, the more pains he is likely to take in the perfection of his products.

Finally, in relation to this subject, I will advise you as to discriminating among the pharmacists of your vicinity. You will find a widespread prejudice existing against such action upon your part, but I have no hesitation in urging you to disregard it. Because a great deal of abuse has existed in the matter of commissions paid by pharmacists to physicians upon the prescriptions sent by the latter, it has come to be regarded with suspicion for the physician to favor a certain pharmacist. As men of integrity and courage, it becomes us to disregard these suspicions and to discriminate in matters which so seriously affect the welfare of our patients. Inform yourselves then as fully as possible concerning the qualifications of the pharmacists of your neighborhood. Learn when and where and in what manner they graduated, what are their habits and what the quality of the materials dispensed by them, and exercise your highest preference. Without unnecessarily casting reflection upon those of whom you disapprove, exert your influence in favor of those whom you find most worthy.

As to those among you who expect to practice in neighborhoods where the service of a qualified pharmacist cannot be secured, or who may intend entering the army or navy, or to be otherwise obliged to depend upon yourselves for pharmaceutical service, there is no recourse but for you to take a special course in pharmacy. While the course here provided will be sufficient for the ordinary needs of a physician, we cannot justly claim that it is sufficient for the class of cases under consideration. The study of pharmacy for professional work is extended and exacting and absolutely requires a special training.

I wish to close this lecture with some remarks upon the subject of the United States Pharmacopœia, the most important text-book which you will be required to consult in this department and one whose character is far too little known in medical circles, notwithstanding that its relation to the subject of Materia Medica is somewhat like that of the Civil Code to the practice of law.

This most important work is prepared and decennially revised by a committee, known as the Revision Committee, of twenty-six men appointed by a convention which meets in Washington every ten years for that purpose. This convention consists of delegates appointed by all the medical and pharmaceutical schools and by the incorporated medical and pharmaceutical societies, of the country and from the United States Army, Navy and Hospital Marine. The endeavor is made to appoint upon the Revision Committee those men especially noted not alone for their knowledge of special subjects connected with Pharmacology, but because of their readiness and ability to institute exhaustive investigations and experimental work to determine those questions which have come forward during the preceding ten years. The convention also gives certain instructions of a very general nature to its committee as to the principles on which that particular revision is to be based.

The Revision Committee immediately organizes and divides its prospective labors into as many separate heads as it is deemed will facilitate the work and make its results the more perfect. These different duties are assigned to special subcommittees. Thus there will be a committee on Fluid Extracts, Tinctures, Elixirs, Chemical Nomenclature, Botany, Powdered Drugs, etc. These several committees, in performing their appointed duties are expected to make prolonged and exhaustive investigations of the questions involved. To give you an idea of how thoroughly this work is performed, I may instance the case of the Committee on Fifty Per Cent. Tinctures. A desire having been expressed by many pharmacistsand physicians for the introduction into the Pharmacopœia of 1890 of such a class of preparations, a competent committee was appointed which devoted more than a year of time and some hundreds of dollars to attempts to actually make such preparations from the different drugs. The report which they presented as the result of their labors was to the effect that it was possible in the cases of only a very few of the drugs to exhaust them of their active constituents by such preparations. When therefore this question comes up in future, as it is certain to do from time to time, the report of this committee may be accepted as pretty conclusive as to the facts of the case. It will be apparent to you that although mistakes are certain to occur and although the discoveries of each ten years will necessitate modifications in the text of the Pharmacopœia, the accuracy of this work may be looked upon as being quite as great as the conditions of the period render possible. When therefore manufacturers come to you with statements concerning the superiority of special methods of manufacture over those of the Pharmacopœia, you should bear in mind that although this is not impossible, the greatest caution should be exercised in assuming that it is true. You may furthermore look upon the text of the Pharmacopœia in relation to those subjects which you are called upon to study as being quite as reliable as anything which it will be possible for you to find elsewhere. If physicians would make a practice of specifying the articles and preparations of the U. S. P., an immediate and very great improvement would result in the practice of medicine. It is to be understood that these articles and preparations possess definite characteristics, which become legal requirements through their embodiment in the Pharmacopœia so soon as the Pharmacopœia is specified by the physician.

I also call your attention to the fact that most of the criticisms directed against the Pharmacopœia will be found upon investigation to result from a lack of information or thought on the part of the critic. One of the principal criticisms is that the work omits many of the most used remedies of the day, such as antipyrin, for example. Reflection will show that such omission is little short of a necessity. These substances, or many of them, have a composition known only to the manufacturer, so that it is impossible for the Pharmacopœia to provide tests for their identification and for the estimation of their purity. In other words, they are beyond control, and being so, and the manufacturer being in a position to alter their composition at any time without responsibility, it follows that the Pharmacopœia cannot become responsible for their unofficial character.

Another objection to the Pharmacopœia is that it includes a large number of substances not in common use. Here it is to be borne in mind that what is not in common use in this locality may be so in the South or West or in some other locality. The Pharmacopœia is understood to be established for the protection of the people, in order to insure their securing the substances intended by the subscriber or purchaser and of determinable purity. As it is a national work, it must include all parts of the nation in its provisions, and the facts here referred to with regard to the extent of the use of the different articles are most carefully sought at each revision. You will thus understand how it is that many practically inert substances, like burdock and dandelion, find a place within its pages. The Pharmacopœia revisers hope with others that a higher education may lead to a discontinuance of the use of such articles, but while they are in use they feel called upon to throw the protection of this work around those by whom they are used.

In conclusion, gentlemen, I can only repeat that the Pharmacopœia is worthy of your highest confidence, and express the hope that you may never look elsewhere for any information which it is possible to find within its pages.

[NOTE TO STUDENTS of the Era Course: No recitation blank will be issued upon this lecture.]

A PROCESS FOR THE MANUFACTURE OF LEAD SULPHITE FOR USE AS A WHITE-LEAD PIGMENT. A. C. J. Charlier, Glasgow, has taken an English patent on a process thus described in Jour. Soc. Chem. Ind.—A current of sulphurous acid gas is led, at a pressure of 10 or 12 pounds per square inch, through a number of vessels, containing finely ground lead oxide, made into a paste with water, and maintained at "the proper temperature" by means of steam coils and agitators. The operation may be conducted so as to produce either a basic or a normal sulphite of lead; and if the former, it may be neutralized with sulphuric acid in order to yield a mixture of sulphite and sulphate. If preferred, carbonic acid may also be introduced simultaneously into the vessels, when the resulting precipitate will consist of the carbonate as well as the sulphite. The advantages of the sulphite of lead are said to be that it is non-poisonous, and has greater covering power and body than any other white lead at present manufactured.

PROCESS AND APPARATUS FOR PURIFYING CARBONIC ACID, form the subject for an English patent, taken out by I. Qurin, Cologne, Prussia. Impure carbonic acid is strongly compressed in contact with water containing an oxidizer, such as potassium permanganate, in solution; dissolved gases, other than carbonic acid, are expelled either by passage of pure carbonic acid or by diminution of pressure; and, finally, the dissolved carbonic acid is released "by pressure diminution or by use of vacuum." "The water makes a continuous circuit through the whole apparatus employed, being saturated in the absorber with the carbonic acid, and freed in the purifier from foreign gases, in order to separate in the gas-remover the purified carbonic acid."

(*Concluded from page 877, Dec. 9.*)

GENERAL PHARMACY OF DRUGS FOR HOMŒOPATHIC USE.*

DRUGS AND MEDICINAL SUBSTANCES—Continued.

General Treatment of Fresh Succulent and Dried Drugs.—Freshly gathered whole plants, flowers, and such roots as are to be used in their fresh state, should be made into tinctures (or triturations) as soon as possible. If this can not be done at once, such substances should not be allowed to dry. This is best prevented by keeping them in a refrigerator or other place, the temperature of which is not far above the freezing point (32° F.). They should not be immersed in water, but merely sprinkled, in order not to extract or dilute the natural juice, the proportion of which is to be ascertained and considered as a part of the menstruum in making a standard tincture.

The treatment of dried substances is different. Odorous substances are to be kept perfectly isolated, in tightly closed boxes or vessels adapted to this purpose, in order that the peculiar odor of such drugs may not be imparted to others. This is too often the case in the premises of the general apothecary, where all wares are impregnated with the mingled odors and dust of various drugs and perfumes. Such a condition of things is absolutely to be prevented in an homœopathic pharmacy. The precautions made use of should include those against light, heat and moisture.

Dilutions or Liquid Attenuations.—The homœopathic axiom calls for the utmost simplicity in prescribing and preparing drugs; hence only one medicine is used at a time, that is, it is never mixed with another medicine. It was also early discovered that a very small quantity of medicine would produce effects, provided it was well diluted with menstruum or solvent, by means of which expansion the immense increase in points of contact more than compensates for the minuteness of the quantity.

The process of dilution by means of a progressive scale of 1 part of tincture to 100 parts of vehicle, known as the centesimal scale, was recommended by Hahnemann and adopted by him as the standard. Under this rule, each attenuation contained just 1-100 part as much of the drug-substance as the preceding attenuation. In order to secure intermediate grades of strength, there has since been introduced the method of diluting in the proportion of 1 in 10, in place of 1 in 100, thus constituting the decimal scale. The great advantage offered in the use of this scale has led to its almost universal acceptance and adoption for the preparation of dilutions and triturations, although many still adhere to the use of the centesimal scale in the marking of the strength. This adherence to a dual system has led to great confusion, and we have yet to learn of any satisfactory reason why it should be continued. We have therefore adopted the decimal system as the standard scale of attenuation and notation, under which each successive dilution or trituration contains just 1-10 as much of the drug substance as the preceding dilution or trituration.

Attenuation or Expansion is accomplished in the process of dilution as well as in that of trituration with milk-sugar, by the interposition of the vehicle between either the molecules of the fluid, or the particles of the solid drug to be attenuated. This interposition is molecular in the case of soluble substances. In dry triturations there occurs only the interposition of milk-sugar between the minutest particles attainable by trituration of hard, insoluble substances. In triturations of moist and soluble substances a molecular saturation of milk-sugar must be assumed to occur.

In the decimal scale the original quantity of medicine is divided progressively by ten, so that the first decimal (1x) contains 1-10, the second decimal (2x) 1-100, the third decimal (3x) 1-1000 of the original substance suspended in and attenuated or expanded by, the diluent, alcohol or other menstruum. As solutions and tinctures, according to our rules, are to contain one part of drug substance in ten parts by volume of diluent, each tincture (with some exceptions to be stated) is equal or equivalent in medicinal strength to the first decimal dilution (1-10 or 1x).

Where certain drugs are insoluble in the proportion of 1 to 10 and require more solvent, like arsenicum album, phosphorus, sulfur, etc., their original solutions or tinctures should be prepared in the proportion of 1 to 100, or 1 to 1,000, dependent on the degree of solubility, and the resulting solutions or tinctures are to be regarded as the second decimal (2x) or third decimal (3x) respectively.

Divisibility of Soluble Medicinal Substances.—Before stating the method of making dilutions, the pharmacist should be reminded that up to a comparatively recent period of the present century, matter was considered infinitely divisible, and hence there was no objection to the infinite dilution or attenuation of medicines. But since more recently the older monadic atomic theory has been developed into molecular science, now forming the basis of physics, chemistry and other branches of science, the infinite divisibility of matter is no longer upheld, and the limits of divisibility, for our purpose at least, are more than approximately placed in the neighborhood and somewhat below the 12th centesimal or 24th decimal degree of attenuation of soluble substances. While we are bound to ignore nothing which modern science has revealed, and while we are desirous of keeping abreast of it, it is not incumbent upon us as pharmacists to limit by any arbitrary rule the degree of dilution or trituration which might be desired.

To make Dilutions or Attenuations of Soluble Substances, proceed as follows:

Take a new, well-cleaned vial—a tube vial of a capacity of two drachms or more is to be preferred—measure into it one cubic centimeter of the tincture to be diluted, and with a file mark on the vial the height of the liquid. Then add nine cubic centimeters of the alcohol, and likewise mark the height of the whole on the vial; cork it well with a well-washed flawless cork, and shake it thoroughly until the contents are well mixed and blended. Pour this dilution into another clean, well-corked vial, and mark it with the name of the medicine, followed by the sign 2x, indicating the second decimal dilution; the tincture from which it is made, according to the preceding specifications, being equal to the first decimal dilution or solution.

The first vial bearing the marks is now to be used as the measuring vial for subsequent dilutions of attenuations. These are to be made in the same manner, by pouring one cubic centimeter of the preceding dilution into the measuring-vial up to the lowest mark, and then adding 9 cubic centimeters of alcohol to the highest mark, shaking, turning into another vial, labeling and marking it 3x, and so on as far as desired. Using the same measuring-vial will ensure exactitude and save trouble of dropping or re-measuring. Dispensing alcohol (88 per cent. by volume) is used from the 3x upwards, unless otherwise directed.

The result of the whole process, including that of the making of the tincture, is easily understood by referring to the following synopsis:

Belladonna, Φ 1-10	1 volume
Distilled water	4 volumes
Dispensing alcohol	5 volumes
	——
Are equal to	10 volumes
Belladonna 1-100 or 2x.	

If tinctures are not made in accordance with our formula of 1-10, if their medicinal strength is known, the volume of diluent required will have to be calculated accordingly. If the tincture is made in proportion of 1-100 add 9 volumes of solvent to 1 of the tincture, and mark the dilution 3x. If the tincture is in proportion of 1-1000 the first dilution made as above is to be marked 4x, etc.

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*Pharmacopeia of the American Institute of Homœopathy.

Triturations.—These consist of any medicinal substance ground as finely as possible with milk-sugar, which by virtue of its hard and gritty nature is admirably adapted to the fine sub-division of the drug matter ground with it. Triturations are analogous to dilutions on account of the interposition of another neutral substance between the dry particles whose combined surface is greatly increased by their reduction to extreme fineness; this, however, is not to be confounded with molecular fineness, which cannot be reached by mortar grinding. This sub-division enables a minute fraction of a grain to exert more toxic and curative influence respectively than a larger uncomminuted portion could do.

Therefore, triturations of substances insoluble in water or alcohol, should not be used for dilutions. But as triturations may be made of soluble substances derived from vegetable, animal, and chemical products, these may, if desired, be used for dilutions, though it is preferable to adhere to the rule before given, to make solutions of soluble substances, and to reserve insoluble substances for triturations.

To make Triturations.—The method of Hahnemann is still adhered to with the exception of using 1 part of the drug to 9 parts instead of 99 parts of milk-sugar. And instead of adhering to the one-hour rule, the time to be allotted to triturations is determined by the nature of the substance triturated and by the fineness to which it is possible to reduce it. If an insoluble substance, this can best be determined by the microscopic test, as will be shown.

Mortar and pestle should be as clean as it is possible to make them by steam or by washing them with water and rinsing with alcohol, and then drying by moderate heat, avoiding exposure to dust.

Separate mortars are to be provided, especially for non-volatile or insoluble substances like copper, lead and other metals, charcoal, lime, sulfur, etc. The mortar should not be made to grind more than one-tenth of what it will contain, otherwise the trituration will be imperfect.

First Trituration.—The above details being arranged, add 1 part by weight of the drug to 9 parts by weight of finely powdered milk-sugar and triturate until the largest drug particles do not exceed 1-100 of an inch in diameter. This rule is not applicable to moist and soluble substances, and relates chiefly to those which are hard and practically insoluble, such as metals and minerals. It will be found difficult to reach the desired comminution under a time limit, and therefore the old one-hour rule is not to be depended upon. some substances being reducable in less, while most of the metals require much more time. When this stage has been reached (or, if the grinding has been prolonged at least for two hours) the product is to be designated as the first decimal trituration, 1-10 (1x).

Second Trituration.—This is made by adding 1 part by weight of the 1x trituration to 9 parts by weight of milk-sugar, and by continuing the process of trituration until the largest drug particles have been reduced to not more than 1-2000 of an inch in diameter, except in case of drugs with which experiment has demonstrated the impossibility of attaining this degree of fineness.

The third, fourth and subsequent Triturations are to be made in the same manner, that is, by grinding 1 part by weight of the preceding triturations with 9 parts by weight of milk-sugar, until the largest particles of the third trituration do not exceed 1-4000 of an inch in diameter, with some few exceptions where experiment has demonstrated the impossibility of reaching this degree of fineness. In the fourth and subsequent grades, the process of grinding should be continued until each 100 grains has received the same amount of trituration as was required to reduce the drug-particles in the 2x of the same medicine to the degree of fineness demanded by the tests given for the 2x triturations.

Tests of Triturations.—The following tests for the determination of the quality, especially of the second trituration, are adopted, though the tests apply to all. The microscope is the best, if not at present the only means of determining the degree of comminution during trituration. In order to obtain the best observations, dry powder should not be used, but a small fragment, no larger than a mustard seed, should be dissolved on a glass slide by adding a minute drop of water and gently warming it over a spirit lamp, avoiding ebullition. It may then be examined under a covering-glass, or allowed to dry into a clear, varnish-like spot. A ½-inch objective will easily disclose the largest particles; but a higher power, such as 1-6 to 1-9, is required to see and measure particles as minute as 1-2000 mm. After a little practice, a much lower power will answer.

This is not to be regarded as a severe test for the microscope, which will disclose much more minute objects.

Other important tests are as follows:

The powder should not feel gritty when rubbed between thumb and finger.

If any drug particles are visible to the unaided eye by good daylight, the triturations is to be regarded as very coarse and imperfect.

If three grains of a trituration are shaken in a two-drachm vial filled with water until the milk-sugar is dissolved, the liquid, after standing an hour, should not become clear in good transmitted light; this would demonstrate that the medicinal substance is so finely divided as to remain suspended in the liquid a long time.

In getting beyond the application of ordinary physical tests of drug-examination, the pharmacist must rely for assurance of sufficient fineness of his product, upon the thoroughness of his methods and means. It is well known that the drug, the neutral material and the mortar and pestle being the same, the fineness of the product must depend upon the following conditions:

1. The time occupied in the process of trituration.
2. The extent and correspondence in the curvature of the grinding surface of the pestle or pestles to the interior surface of the mortars.
3. The weight or pressure of the pestles.
4. The speed of pestles or mortar for a given time, or, in other words, the distance traveled by the pestles.

To secure the necessary conditions, and to effect the object in view, various time-saving mechanical devices and different modes of applying power have been proposed. The principles of mechanics must be recognized as applicable here.

Tincture Triturations are prepared directly from strong tinctures, consequently they contain the soluble constituents only of the drug, and should therefore be clearly distinguished from triturations made to include the entire drug-substance. They can be designated by adding a minus sign above the figure denoting strength; for example, $\overline{1\text{x}}$, indicating that this preparation contains less of drug material.

In making add 10 cubic centimeters of strong tincture to 10 grammes of milk sugar, mix carefully in a mortar with pestle and spatula, and cover with pure white paper until the moistened powder is nearly dry; then triturate gently until quite dry, and preserve in glass or porcelain jars tightly closed, in a cool, dry place.

If the tincture used should represent a drug strength of 1-10, the resulting tincture-trituration should be marked $\overline{1\text{x}}$; if, however, the tincture represents but 1-100 it should be marked $\overline{2\text{x}}$.

Succeeding triturations may then be made by adding to 1 part of this tincture-trituration 9 parts of milk-sugar and thoroughly mixing and triturating the same in conformity with rules given for the preparation of other triturations, the product being marked 2x, 3x, etc., according to the amount of drug-substance it may represent.

PHARMACY.

OLEUM RICINI NAPHTOLATUM is castor oil containing 0.2 per cent. each of a-naphtol, chloroform, and oil of peppermint. (Ph. Post.)

PRESENCE OF LEAD IN STERILIZED SERUM.—A case of poisoning through subcutaneous injection of a serum led to experiments to determine the probable cause. A common salt solution, such as is used for diluting serums, was heated for 20 minutes to 120° C. in flasks of various kinds of glass and it was found that lead glass was acted upon with the formation of lead chloride and sodium silicate, the lead partially crystallizing out on cooling. Such a solution, used for diluting a serum, would cause very serious lead poisoning, so much more so, as the lead enters directly into the circulation. (Jour. de Ph.)

ARTIFICIAL MUSK.—Two methods for preparing substances having a musk-like odor have been patented. (1) A butyltoluidine or homologue is converted into the corresponding mononitro-compound and this further nitrated with fuming nitric and sulphuric acids. The resulting compound has a strong musk odor. (2) Trimethylmethane, xylol, and dimethylethylmethane are treated under stated conditions with sulphuric acid to form trimethylmethanedimethylbenzolsulphonic acid. This is nitrated and the product neutralized with ammonia and crystallized from alcohol.—(Chem. Industr., through Ap. Zt.)

DIIODOSALICYLIC ETHERS AS SUBSTITUTES FOR IODOFORM.—Clinical tests, particularly of the methyl ether, indicate that it is a reliable substitute for iodoform, fully equal to it in healing power and preferable to it because entirely odorless and nontoxic. The methyl compound crystallizes in small, brilliant needles, melts at 110° C., and dissolves with difficulty in cold alcohol, more readily in hot alcohol and in ether. The ethyl compound crystallizes in quadratic plates, melts at 132°, and is less soluble in alcohol and in ether than the methyl ether. Both are very sparingly soluble in water. (Chem. Ztg., through Ap. Ztg.)

"ABSTEME" ESTIMATED.—The latest of the so-called cures of the alcohol habit is "Absteme," on which Prof. Attfield is reported to have given the following opinion (Br. & Col. Dr.): "My analysis of the liquid termed 'Absteme' shows that it contains 45 per cent. of proof spirit, 1½ per cent. of sugar, half of 1 per cent. of aromatic medicinal vegetable bitters, and 53 per cent. of water. I do not find any important alkaloid, or any mineral medicinal substance, or anything to warrant the statement on the label as to the liquid curing drunkenness or destroying the appetite for intoxicants. The active ingredient is not present in sufficient amount, even in the stated maximum dose, to make that thorough impregnation of the system implied on the label; and, oddly enough, for a medicine named 'Absteme,' and asserted to be an anti-intoxicant that ingredient is alcohol—present in the proof spirit."

OWNERSHIP IN METEORS.—Apropos of meteorites the following amusing story is told by Sir Robert Ball respecting one of these celestial visitors. (Sci. Am.) A meteorite which fell on a farm in America was claimed by the ground landlord, as his lease reserved all minerals and metals. The tenant objected on the score that the article was not on the property when the lease was executed. The landlord then claimed it as flying game, but the lessee pleaded that the thing had neither feathers nor wings, and claimed it as ground game. But while the dispute was going on the customs officers seized the meteorite, on the ground that the revenue had been defrauded by its introduction into the country without payment of duty.

PRESERVING PLANT COLORS.—A. F. Woods describes (Bot. Gaz.) a method of preserving the green color of plants for exhibition purposes which appears to be similar in principle to the coppering of green peas. Air is removed as completely as possible from the surface and intercellular spaces of the plants by immersion in 90 to 95 per cent. alcohol, or an air-pump may be employed. The plants are next immersed in dilute glycerin (5 per cent.), to which a bluish tint has been imparted by means of copper sulphate or acetate. The copper combines with the chlorophyll, forming copper phyllocyanate, which is practically insoluble in any ordinary preservative medium except strong alcohol, and is not affected by light. Any excess of copper salt may be dissolved out by a mixture of dilute glycerin and formalin, which may also be employed with advantage as the preservative medium.—Pharm. Jour.

ARTIFICIAL OYSTERS.—The municipal authorities of Paris are just now engaged in the suppression of an altogether novel form of food adulteration which is assuming phenomenal proportions, says the New York Tribune (Sci. Am.). Real oysters are expensive in Paris, and so, with the object of suiting slender purses, artificial oysters on the half shell have been invented, which are sold at twenty cents a dozen, and they are so cleverly made and look so nice and fresh that, once lemon juice or vinegar has been added, they cannot be distinguished from the real article, especially when white wine is taken in connection therewith. The only genuine thing about these oysters is the shell, the manufacturers buying second-hand shells at a small cost, and fastening the spurious oyster in place with a tasteless paste. The municipal laboratory has not yet proclaimed the ingredients of which these bogus oysters are composed, but has announced that they are of a harmful character.

PERCARBONATES.—MM. Constam and A. von Haussen have discovered in the percarbonates a new class of oxidizing substances. On electrolyzing a saturated solution of potassium carbonate and gradually lowering the temperature, the disengagement of oxygen at the anode gradually diminishes and finally ceases at about -10° C. At the same time, potassium percarbonate, $K_2C_2O_6$, is formed as a bluish amorphous powder. It should be quickly thrown on a filter and dried over phosphoric anhydride, as it is very hygrometric and decomposes water at ordinary temperatures, the bicarbonate being formed. When gently heated, oxygen and carbon dioxide are given off, the normal carbonate being left, and in the presence of oxidizable matters it acts as an oxidizing agent. But it can also act as a reducing agent, manganese dioxide being converted by its action into the carbonate. The authors conclude, therefore, that the new body is the neutral carbonate of potassium peroxide. Like the higher alkaline oxides and the alkaline earths, it produces hydrogen peroxide in the presence of acid. —Zeit. f. Electrochemie, through Chem. News, Pharm. Jour.

REPORTED DISCOVERY OF STRONTIUM.—The discovery of a large bed of strontium at Put-in-Bay Island, reported from Toledo, has awakened a considerable amount of interest among the manufacturers of fireworks, says Sci. Amer., as it is thought likely that it will result in a considerable reduction in the price of all fireworks, in which strontium nitrate or strontium carbonate is used. One large manufacturer of fireworks in New York, who makes use of about one hundred and fifty tons of strontium nitrate in a year and imports the whole of it from Europe, states that it costs his firm now about seven and a quarter cents a pound. If the strontium should be found in large quantities, it would have the effect of lowering the cost of certain classes of fireworks, that is, all those that use a red or crimson light. At present the supply comes chiefly from Germany, and the American manufacturer has to pay a high price for it.

NOVEL METHOD OF FEEDING PLANTS.—The following note by Mr. Paul, of Cheshhunt, in the Gardner's Chronicle (Pharm. Jour.), on the method employed by M. Georges Truiffent for administering artificial food to plants, is of considerable interest to horticulturists. After an analysis of the ash of the living plant, the necessary salts for a given time, such as six months, are weighed out and enclosed in a metal cover to form what is called a "pill," which is presumably inserted in the pot, diffusion of the salts taking place through the folds of the metal, and the thicker the metal the slower the diffusion. As the salts dissolve and disappear they are replaced by a core which expands until it completely fills the "pill." The salts have no action on the metal cover, which remains firm and hard. It is stated that the solubility of the salts can be so regulated that a "pill" may be made to last three or six months, as may be desired. By this method of feeding, large well-colored plants are grown in pots of less than half the usual size.

PROCESS FOR OBTAINING TARTARIC ACID AND TARTRATES.—A. Schmitz and E. C. W. Toenges, Düsseldorf, Prussia, have patented in England a process by which argols, or other crude tartars, are boiled with an alkali carbonate solution in slight excess, and the solution is treated with hypochlorite and neutralized as before. Pure calcium tartrate is then thrown down by calcium chloride, and may be decomposed in the usual manner to obtain tartaric acid. When it is desired to obtain cream of tartar, the calcium tartrate, first obtained as described, is boiled with potassium carbonate solution, and after separating the calcium carbonate, the liquid is treated with a little hypochlorite, and acid potassium tartrate is thrown down by addition of a suitable acid. The claim is for the obtaining of "tartrate of lime from raw products, partly manufactured substances; by products and refuse containing tartaric acid and tartrates" by the process described.

ANTIDOTES FOR SNAKE POISON.—Dr. Thomas R. Fraser, of the University of Edinburgh, Scotland, has recently made public what he calls "an absolute antidote for the bite of the most deadly serpent." He says: "I have also found that the substance from which the antidote is secured is strongest and best in the serpent whose bite is the most deadly." Briefly stated, this new antidote is the bile or secretion of the gall bladder. In its crude form, the bile is only administered directly to the wound or by the stomach. But the antidotal constituent of the bile is said to be the most effective when it is separated from the remainder of the substance found in a serpent's gall bladder, and injected beneath the skin. Dr. Fraser says the bile of any serpent is an antidote for the bite of a venomous species. This seems very reasonable, for, as has long been known to scientists, the venom of poisonous snakes has no ill effects when introduced—by accident or otherwise—into either their own circulation or that of the harmless kinds, common belief to the contrary notwithstanding.—Chas. H. Coe, in Sci. Am.

DISINFECTING POWER OF ANTISEPTIC DUSTING POWDERS.—The disinfecting power of iodoform consists principally of the following factors: (1) It forms combinations with the decomposition products of micro-organisms. (2) It acts at a distance, which enables it to prevent more or less effectually the growth of many bacteria and to kill others outright. (3) It stimulates the tissue, also in consequence of its distance action, to augment its power of resistance. (4) It has the power, though weak, to destroy bacteria, more particularly when in solution.—Electrolytically prepared iodoform is more energetic than the ordinary crystalline variety.

Other antiseptics apparently have no such combined effect as iodoform. Their action is only local, i. e., they influence only the parts in contact unfavorably for the development of bacteria or destroy them.

Airol, iodogallicin, xeroform, and above all the easily soluble gallicin are recognized as good antiseptics. Aristol and iodol show less clearly a bactericide action; the latter, however, approaches iodoform in some respects. Amyloform and dermatol possses very slight power against bacteria, at least in artificial culture, media. (Zentralb. f. Bact. u. Parask., through Ap. Ztg.)

AMMONIUM SULPHATE is manufactured from the ammoniacal liquors of gas works by distillation, the ammonia gas being taken up by sulphuric acid and the product crystallized. In this process the salt is in some instances nearly white in color and in others gray; the trade designations are white, good gray, and gray. All contain the same amount of ammonia and they are used in the production of aqua ammonia, anhydrous ammonia, alum, etc. Large quantities of ammonium sulphate are also produced by bone coal manufacturers from bone liquor, but the product has a strong odor and is quite unfit for the manufacture of aqua ammonia. It is used in the manufacture of fertilizers. Anhydrous ammonia, one of the products made from gray ammonium sulphate, is largely used in ice freezing machines and for refrigerating purposes in cold storage establishments and breweries. It is also used in the production of explosives and chemicals. As a fertilizer ammonium sulphate may be applied directly to the soil as a forcing manure, although practically and economically it is not so used. Generally it is mechanically mixed and combined with other substances which furnish phosphoric acid and potassium, both of which are necessary chemical elements for perfecting plant growth.

CAUSES OF SPONTANEOUS COMBUSTION OF OILS.—In connection with the experiments instituted by R. Kissling, as regards the increase of temperature caused by impregnation of fibrous or porous stuffs with linseed oil, the author states the results of his researches. In accordance with former observations, a maximum of weight by absorption of oxygen in the case of raw and boiled linseed oil only appears after several days, while with oils treated with metallic oxides this is the case already after twenty hours, old linseed oil showing one of 15 to 16 per cent., young products up to 19 per cent. at most. The spontaneous combustion is well exemplified by the following experiment: A piece of wadding which had been used for the filtration of oils, that contained, besides copal, resin and turpentine oil, chiefly linseed oil boiled with metallic oxides, was laid in a place exposed to the wind, so as to prevent a supply of heat from outside. A thermometer stuck into it soon showed 60°, then 138°, inside of 45 minutes it had reached 275°, and suddenly rose above 300° (C. ?) On folding the wadding apart, the interior was found to be strongly charred, and in the charred places glimmering was at once perceptible, which passed into ignition upon admission of a draught of air. According to the explanation of the author, an autoxidation was made possible in consequence of the presence of metallic compounds, and the previous heating. Owing to the poor conduction of heat, the heat was held together and through decomposition of organic substances carbon was liberated, which took fire through a supply of air. Further experiments demonstrated that ignition is only possible if the separated carbon comes into contact with a sufficient volume of air.—W. Lippert, Zeitschrift für Angewandte Chemie; Sci. Am.

PROPERTIES OF LIQUID FLUORINE.—At the November meting of the Chemical Society (Eng.), Professor Dewar read a paper on this interesting topic. We make use of the report prepared by Pharm. Journ. A table presenting a comparison of the boiling points of fluorine derivatives of organic bodies with the corresponding chlorine, bromine, and iodine derivatives was first shown. Fluobenzene boils 5° higher than benzene, chlorobenzene 47° higher; para fluoaniline boils 4° higher than aniline, parachlor aniline 43° higher, and so on. This comparison indicates that fluorine must possess a very high volatility, an inference that follows also from the researches of Dr. Gladstone upon the refractive indices of these bodies. Diagrams of the apparatus used for liquefying flourine were shown. Although no vessels of transparent material other than fluorspar, which is exceedingly brittle, can be used for the manipulation of gaseous fluorine, yet in view of the fact that chemical reaction is suspended at very low temperature it was surmised that glass might be used as a receptacle for liquefied fluorine, and the supposition proved correct. The gas was to be condensed in a platinum tube, from which it could flow into a glass bulb. When the platinum tube was surrounded by boiling oxygen at a temperature of -183°, no liquefaction took place, but on exhausting when the temperature went down to -185°, a yellow liquid collected in the tube, the color of which had an intensity such that .5 Mm. equaled a tube of the gas 1 metre long. At this temperature neither silicon, boron, nor carbon incandesces when thrown into the liquid, and no iodine is liberated from iodides, but the affinity of fluorine for the hydrogen of hydrocarbons is still sufficiently great to cause the ignition of benzene. Solid turpentine is attacked, and a jet of hydrogen directed on to its surface is at once ignited. It has no action upon ice or upon mercury, but a body, presumably a hydrate, which exploded upon the rise of temperature, was obtained. Its boiling point lies in the neighborhood of -187°, the critical point is -120°, and the critical pressure 40 atmospheres. Attempts to solidify the gas were futile; it remained liquid at -210°. To estimate the density of liquid fluorine, recourse was necessary to the observation of its buoyancy for solids of known density, such as wood, amber, ebonite, and methyl oxalate. Amber of specific gravity 1.14 was found to float or sink indifferently, and its density is, therefore, equal to that of the liquid. The refractive index of the liquid is greater than that of liquid oxygen—with which it mixes in all proportions—but its capillary constant is less. With the spectroscope it gives no absorption bands, nor does it show any magnetic phenomenon. Its exact refractive and dispersive indices remain to be determined, but the law that a gas should have the same atomic refraction in the liquid condition as in the gaseous seems to be here departed from, that of fluorine being higher in the liquid state. In the discussion following, Dr. Gladstone commented upon the singular variance of liquid fluorine in its refractive properties from what had been expected. Dr. Perkin mentioned that while by the introduction of chlorine, bromine, or iodine, into the benzene molecule the rotation is increased, if one introduces fluorine the rotation goes down; the only analogy he could recall was that of the NO_2 group, the behavior of which has some resemblance to that of the fluorine atom. Professor Thorpe recalled the fact that while experimenting upon arsenic fluoride, he had noticed that a glass tube immersed in the liquid was quite invisible, and had a refractive power therefore corresponding with that of the liquid.

QUESTION BOX

The object of this department is to furnish our subscribers and their clerks with reliable and tried formulas and to discuss questions relating to practical pharmacy, prescription work, dispensing difficulties, etc.

Requests for information are not acknowledged by mail and ANONYMOUS COMMUNICATIONS RECEIVE NO ATTENTION; neither do we answer queries in this department from non-subscribers.

Compound Syrup White Pine Bark.

(C. B.) See the following issues of this journal: March 25, 1897, page 363; April 1, 1897, page 393; and Nov. 25, 1897, page 800. A formula may also be found in the National Formulary.

One-Half Per Cent. Corrosive Sublimate Solution.

(W. J. K.) If you will read carefully the abstract on "comparative value of various disinfectants," this journal, Nov. 25, 1897, page 798, you will notice that a ½ per cent. (p. c.) solution of corrosive sublimate is taken as the standard of comparison and as such its disinfectant and antiseptic values are each 100. A ½ per cent. solution of corrosive sublimate is one which contains ½ grain of corrosive sublimate dissolved in 99½ grains of water.

Is Tobacco a Drug?

(R. B. H.) writes: "I had a friendly controversy with a party in regard to tobacco. I take the position that tobacco is a drug; he denies my statement. Am I correct?"

Yes. Tobacco is a drug, in the sense that it is sometimes employed in the cure of disease, and it is official in several pharmacopœias. Its employment as a medicinal substance, however, is extremely limited and insignificant, in comparison with its importance as a commercial product.

Elixir Buchu, Juniper, Dandelion and Saw Palmetto.

(J. F. S.) Try the following:

Fluid extract buchu	1	fl. ounce
Fluid extract juniper berries	½	fl. ounce
Fluid extract saw palmetto	1	fl. ounce
Fluid extract dandelion	1	fl. ounce
Syrup	1	fl. ounce
Alcohol	2	fl. ounces
Magnesium carbonate	2	drams
Aromatic elixir, U. S. P., enough to make	16	fl. ounces

Mix the fluid extracts with the alcohol, then add about seven ounces of aromatic elixir and the syrup. Incorporate with the mixture the magnesium carbonate, and filter. Finally pass enough aromatic elixir through the filter to make the finished product measure 16 fluid ounces.

Violet Water.

(W. J. L.)

(1)	Essence of violet	14	fl. drams
	Essence of rose	5	fl. ounces
	Essence of cassie	5	fl. ounces
	Alcohol, enough to make	1	gallon

Water may be added, if a cheaper preparation is wanted.

(2)	Extract violet (from pomade)	1	fl. ounce
	Extract cassie (from pomade)	1	fl. ounce
	Spirit of rose	½	fl. ounce
	Tincture Florentine orris	½	fl. ounce
	Cologne spirit	1	pint
(3)	Violet extract	5	kilos
	Jasmine extract	20	grams
	Rose extract	10	grams
	Jonquille extract	30	grams
	Tincture of orris	50	grams
	Tincture of cinnamon	30	grams
	Tincture of musk	2	grams
	Tincture ambrette	20	grams
	Tincture of vanilla	2	grams
	Jasmine water	200	grams

Abbreviated Directions.

(L. M. D.) The abbreviated directions you submit "f. ʒj. q. i. d. p. c.," may be translated, "one fluid dram four times a day, after meals," the "q. i. d. p. c." undoubtedly standing for the Latin words, "quater in die, post cibum." It is barely possible that the character you have copied as a "q" may have been intended for a "t" (ter in die, etc.), the directions "three times a day, after meals," being more common than "four times a day, after meals" from the fact that it is customary to have but three meals a day. In order to form an intelligent opinion the directions should be read in conjunction with the prescription which you have failed to enclose with your query.

Texas Pharmacy Law.

(J. K.) Texas has a pharmacy law which applies to towns of more than one thousand inhabitants. Briefly, the law provides for two grades of licentiates, qualified pharmacists and qualified assistants. The former must be twenty-one years of age and have had two years' experience before examination. Graduates of reputable colleges of pharmacy which require two years' experience before granting a diploma, are registered as pharmacists without an examination. The fee for examination and registration is five dollars; for registration on diploma, three dollars. Instead of the usual State board of pharmacy there exists in Texas a board of "pharmaceutical examiners" for every judicial circuit in the State. The members of the respective boards receive their appointments from the presiding judges of the district courts. Each board elects its own officers; the secretary being designated in the act as "Registrar." The various boards hold examinations once a year. As you have not given us the name of the town or city where you wish to locate, we cannot give you any information regarding the name of the secretary to whom you should write. Tell us where you wish to locate and we will try to help you out.

Preparation of Beeswax.

(T. J. K.) Ordinary beeswax, or yellow wax, is obtained from honeycomb after the honey has been removed. The comb is melted in boiling water, which is kept hot for some time to allow the impurities to separate, and either subside or be dissolved by the water. When the mixture cools the wax concretes. It is then removed, again melted in boiling water, strained and poured into pans or other suitable vessels. White wax is made from yellow wax by a process of sun-bleaching, which is in outline as follows: Melted wax is solidified in the form of thin ribbons or bands, by allowing it to flow over wet revolving cylinders; these bands are moistened with water, and exposed to sunlight in the open air. After exposure for some time the color disappears in spots and the wax is again melted, re-solidified and treated as before, the process being repeated from time to time until the wax is completely bleached, when it is finally melted and run into molds; besides losing its color, wax thus treated is somewhat changed by long exposure to light and air, and is more disposed to rancidity than yellow wax, as is noticeable in the modified color. For quite a lengthy article on the methods of bleaching wax, used by manufacturers, see this journal, May 20, 1897, page 594.

St. John's Bread Extract.

(E. S. E.) We know of no specific formula for a preparation of this character. St. John's Bread is one of the synonyms for the pods of the Ceratonia siliqua L., or the carob tree. These pods are used as food in many parts of Africa, the East Indies and the warm countries of Europe. In Sicily a spirit and a syrup are made from them. The husks of the pods being often used for swine, are called swine's bread, and are thought by some to be referred to the parable of the Prodigal's Son. The pods are sometimes called locusts, and were formerly thought to be the locusts eaten by John the Baptist, and hence have been called St. John's Bread. Baron Ferd von Miller (Select Extra-Tropical Plants), says that the exportation of the pods for cattle food from Creta is very large. In some of the Mediterranean countries horses and stable cattle are almost exclusively fed upon them, and according to the author last named, the fattening properties of this kind of food are twice those of oil cake. Six pods a day are given of the crushed pods, with or without chaff. He says the Spanish Conquerors took this plant early to Central and South America. A preserve or confection like tamarinds has been made by the Arabs from the pulp and used as an aperient. Gray's "Treatise on Pharmacologia," a work published in the early part of the century, says the pods were used considerably at that time in preparations designed to possess ophthalmic, cooling or pectoral qualities.

Spavin Cure.

(W. H. B.) We cannot give the formula for the proprietary remedy. Some one of the following may be of service:

(1)	Oil of turpentine	14½ fl. ounces
	Alcohol	13 fl. ounces
	Tincture of iodine	1¾ fl. ounces
	Camphor	1¾ ounces
	Oil of sassafras	1¾ fl. ounces
	Crude petroleum	1 fl. ounce
	Corrosive sublimate	70 grains

Dissolve the camphor and corrosive sublimate in the alcohol and add the remaining ingredients.

(2)	Powdered cantharides	4 ounces
	Oil origanum	4 ounces
	Oil amber	4 ounces
	Oil turpentine	4 ounces
	Cottonseed oil	4 ounces
	Sulphuric acid	1 ounce

Mix all except the acid in a broad, shallow vessel like an evaporating dish, then very slowly and with constant and rapid stirring add the acid; when the liquid has cooled it may be bottled.

(3)	Oil red thyme	3 parts
	Rectified oil of amber	8 parts
	Oil of rosemary	10 parts
	Camphor	20 parts
	Alcohol	30 parts
	Sulphuric acid	90 parts
	Oil of turpentine	340 parts
	Sulphurated oil	2.190 parts

Follow directions for compounding under previous formula.

GUTTAPERCHA AND CAOUTCHOUC CEMENTS.—Leather guttapercha cement: Melt together 100 parts guttapercha, 100 parts asphalt or pitch, and 15 parts oil of turpentine. To be used hot. Elastic guttapercha cement: Dissolve 10 parts guttapercha in 100 parts benzin and pour the solution into 100 parts linseed oil varnish with thorough agitation. Particularly suitable for fastening soles on shoes. The leather should be roughened before cementing. Cement for fastening rubber on metal: Dissolve shellac in 10 times its weight of ammonia water. After standing three to four weeks a transparent cement results, which can be used without warming. It is gas and watertight and serves also for articles of hard rubber. A mixture of guttapercha and asphalt serves a similar purpose. For leather belts: Made by kneading together 10 parts carbon disulphide, 1 part oil of turpentine, and enough guttapercha to make a thick paste. The leather must be freed from fat and roughened, and after cementing the joined parts pressed together until dry. Caoutchouc cements: Dissolve in carbon disulphide 100 parts finely divided caoutchouc, 15 parts rosin and 10 parts shellac. Mix 1 part caoutchouc, 7 parts mastic and 50 parts chloroform. Let stand several weeks before using. For repairing rubber shoes: (1) Dissolve 10 parts caoutchouc in 250 parts chloroform. (2) Dissolve 10 parts caoutchouc and 4 parts rosin in 40 parts oil of turpentine. Mix equal parts of the solution for use.—(Gummi. Zt., through Drog. Zt.)

The Era Course in Pharmacy

J. H. BEAL, Sc.D., Ph.G., Director.

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LECTURE NO. 33.

Inorganic Chemistry.

The Carbon Family.

CARBON. SILICON. GERMANIUM. TIN. LEAD.

The student who has carefully followed the preceding lectures on the elements will not have failed to notice the following facts:

1. That the halogens are all decided non-metals, but that their non-metallic qualities become less marked as we pass from fluorin to iodin, or as the atomic weight rises. Also that the valence toward hydrogen is *one*, as in HF, HCl, HBr, and HI.

2. That the elements of the oxygen family are less non-metallic as a whole than the halogens, the last member (tellurium) possessing some marked metallic qualities. It is also noted that the hydrogen valence of this family is *two*, as in H_2O, H_2S, H_2Se, and H_2Te.

3. That the nitrogen family, as a whole, presents a marked advance towards metallicity over the two preceding groups. The first two only are typical non-metals, the third is of an intermediate character, while the last two are very decided metals. In this group the hydrogen valence is *three*, as seen in NH_3, PH_3, AsH_3, and SbH_3.

In the present or *carbon family* the same advance in properties continues. Only the first two are non-metals, while the others are metals of a very pronounced character, the last two possessing the quality of malleability. The hydrogen valence of the first two elements is four, as in CH_4, and SiH_4. This is the maximum valence toward hydrogen that is possessed by any element. The last three members of the family are not known to combine with hydrogen in any case.

All the elements of this family form dioxids. Those of carbon, silicon and germanium are acid anhydrids. Tin dioxid can act as an acid anhydrid toward stronger bases, and as a basic anhydrid with stronger acids. Lead dioxid has feeble acid properties.

CARBON.

Symbol C. Valence 2, 4. Atomic Weight 11.97. Specific Gravity 2.01 to 3.6.

Historical.—The several natural forms of carbon have been known for ages, but the element was not clearly recognized as one of the simple substances of nature until near the close of the last century. The proof of the identity of the element in its several natural forms was not clearly established until after the experiments of Smithson Tennant in 1796, and of Mackenzie in 1800.

The name is derived from the Latin *carbo*, coal, or charcoal.

Natural Occurrence.—Carbon occurs free in three allotropic forms, diamond and graphite, both crystalline, and in the amorphous condition, as coal. Combined, it exists in vast quantities in the carbon dioxid of the atmosphere, and in the mineral carbonates. Of these the most abundant is calcium carbonate, found as chalk, limestone and marble, and a double carbonate of calcium and magnesium known as dolomite. Among other metals zinc, copper, barium and iron also frequently occur as carbonates.

Carbon is an essential constituent of all organic structures, both animal and vegetable, and is the element left behind as charcoal or coke when these substances are heated out of contact with air.

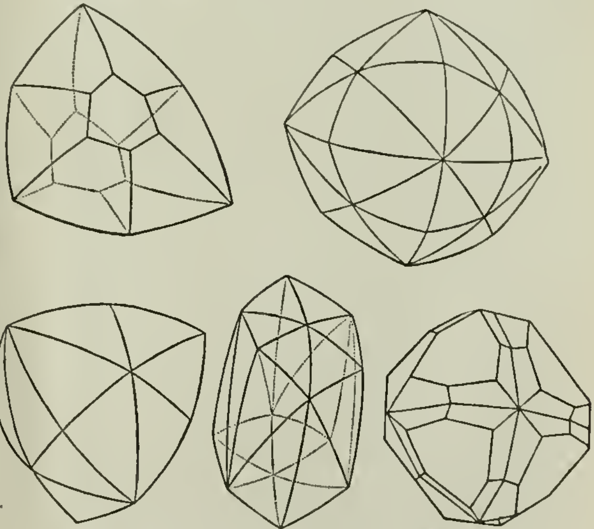

Fig. 37.—Natural Forms of the Diamond.

Perhaps the first of the natural forms of carbon in popular estimation is the diamond, which is nearly pure and colorless crystallized carbon. It crystallizes in the regular system (Fig. 37), is the hardest substance known, capable of abrading all other substances and of being abraded by none, and is a poor conductor of heat and electricity. Its brilliancy is due to the numerous internal reflections which take place within it. Its specific gravity is 3.5 to 3.6. A dark colored or black variety is known as *carbonado*, and has a specific gravity of 3.01 to 3.4. It is used for diamond polishing and for pointing rock-cutting tools. Under the name of *bort*, a coarse kind of diamond is used for glass cutting.

In the absence of air diamond can be heated to a white heat without change, but by the heat of the electric arc is converted into a substance resembling coke. Heated in the air, it ignites at about 1000° C., burning with a slight flame, forming carbon dioxid. Usually a very small amount of ash is left, consisting of mineral impurities. Diamond can also be oxidized to carbon dioxid by the use of powerful oxidizing agents, as potassium dichromate and sulfuric acid.

The French chemist Moissan claims to have obtained diamonds by the sudden cooling of a crucible of cast iron containing dissolved carbon, the great pressure produced at the moment of solidification causing the carbon to crystallize as diamond. The diamonds are recovered by dissolving away the iron by means of acids, and are of microscopic size and dark color.

The second crystalline form of carbon is *graphite*, known also as *plumbago* and *black lead*. It occurs in the oldest geolocigal formations with rocks of the granitic class and also in some cases associated with limestone. Its mode of formation is not definitely known, but it is generally regarded by geologists as of organic origin, probably resulting from the subjection of coal to high temperature under pressure. This hypothesis is rendered probable by the fact that molten iron will dissolve carbon, which can be obtained in the form of scales of graphite when the iron is dissolved in acids.

Graphite is a grayish black mass, having a metallic luster, and on this account is much used as a polish for stoves and other coarse iron work. It has a greasy feel, due to the ease with which the scale-like crystals glide over each other, and is hence used as a lubricator for machinery. Its softness also renders it valuable for the manufacture of the so-called "lead pencil," while its infusibility adapts it to the production of crucibles used in metallurgical operations conducted at high temperatures.

By boiling with concentrated nitric acid it takes up hydrogen and oxygen, and is converted to a yellow crystalline substance known as graphitic acid. The latter when heated decomposes explosively, leaving a voluminous residue of finely powdered amorphous carbon.

The amorphous form of natural carbon is found in the several varieties of coal. This substance is the result of the decomposition of organic matters, mainly vegetable, while buried beneath earth and water. When exposed to air the carbon of vegetable matter passes off as carbon dioxid, but when the change takes place beneath water, oxygen is excluded and the carbon is left behind as an amorphous mass. The first step in the transformation is known as peat, the next as brown coal or lignite, the third as bituminous coal, and the last as anthracite. The greater the age of the coal bed, and the greater the pressure it has been subjected to, the more complete the transformation and the more compact the variety of coal produced. In the passage from peat to anthracite there is a gradual decrease in the per cent. of gaseous constituents, and a consequent increase in the per cent. of solid carbon and mineral constituents.

Preparation.—The preparation of carbon for use in the arts constitutes several of the most important industries. The most important forms of artificial carbon are lampblack, animal and wood charcoal, coke, and gas carbon. All of these are amorphous.

Lampblack is prepared by burning oils or other substances rich in carbon with an insufficient supply of air, and collecting the resulting "soot" in suitable chambers.

By the old method of manufacture wood charcoal is produced by stacking wood in piles, covering with sods and igniting. After the combustion is sufficiently under way, the further ingress of air is shut off, and the pile allowed to smoulder. (Fig. 38.) The water and other volatile constituents of the wood are driven off by the heat of the mass and the solid carbon left behind as a black solid, preserving the grain of the wood, and giving forth a metallic sound when struck. In the more modern method of manufacture, the wood is subjected to destructive distillation in closed retorts, thus permitting the valuable by-products, as tar, acetic acid, methyl alcohol, and gases, to be collected and saved.

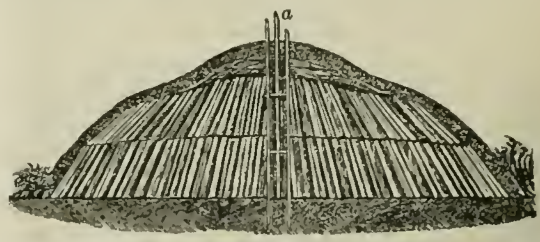

Fig. 38.—Manufacture of Charcoal.

When animal matters, as blood, bones, etc., are subjected to carbonization the product is known as animal charcoal, or the finer qualities as bone or ivory black.

All charcoals, but more especially that produced from animal matter, have the property of readily absorbing and condensing within their pores many gaseous substances, alkaloids, metallic salts and coloring matters. Immense quantities of animal charcoal are used for the purpose of removing the coloring matter of sugar in the process of refining.

Coke is virtually a mineral charcoal, prepared by the carbonization of bituminous coals in kilns known as "coke ovens." The mass, being set on fire, is permitted to burn for some time, when the further supply of air is cut off, and the carbonization completed by the heat already generated. By this wasteful method all the valuable products, as tar, ammonia and combustible gases, are given off into the atmosphere and wasted. Lately more improved processes have begun to be adopted whereby many of these substances may be saved. Considerable quantities of coke are also produced as a by-product in the manufacture of illuminating gas.

Gas carbon is a hard and compact variety of carbon deposited in the retorts of gas works from the decomposition of the gaseous hydrocarbons produced from the coal. It is employed in the manufacture of the carbon rods used in arc lamps, the negative plates of voltaic batteries, etc.

COMPOUNDS OF CARBON.

Hydrogen Compounds.—Compounds containing hydrogen and carbon only are known as hydrocarbons. The simplest hydrocarbon is *methane*, CH_4. It exists naturally as "marsh gas," produced by the decomposition of organic matter under water, and is the principal constituent both of natural and artificial illuminating gases. When formed in coal mines it is known as fire damp. It can be produced artificially by distilling a mixture of dry sodium acetate and sodium hydroxid, when methane and sodium carbonate are produced.

At ordinary temperatures pure methane is an odorless, colorless, tasteless gas. By cold and pressure it can be liquefied or even solidified. In the air it burns with a nearly colorless flame, forming carbon dioxid and water. Like all combustible gases, methane or gases containing it combine with oxygen explosively, if first mixed with air and then ignited.

Methane is an example of a saturated compound, since all the affinities of the carbon atom are satisfied. If one or more of the hydrogen atoms be removed, the remainder is an *unsaturated* compound, and is known as a hydrocarbon *residue* or *radical.* The displaced hydrogen atoms can be replaced with other elements, the compounds thus formed being known as *substitution products.* Some examples of unsaturated residues and of the substitution products which may be formed from them are as follows: CH_3—, the univalent radical Methyl. When the missing hydrogen is supplied by one of chlorin we have CH_3Cl, Methyl chlorid. $CH_2 =$ is the bivalent radical Methylen; saturating with two Cl, we have CH_2Cl_2, Methylen chlorid. $CH \equiv$ is the trivalent radical Methin; saturating with three Cl, we have $CHCl_3$, Methin chlorid or Chloroform, etc. In the preceding formulas the dashes are used to indicate the number of free or unsaturated bonds.

Unsaturated radicals cannot exist alone, and when set free, if they have no other element to combine with, will combine with each other. Thus two methyl residues will combine to form dimethyl, $CH_3—CH_3$, each methyl saturating the other. Such a saturated group can become again unsaturated by the removal of other hydrogen atoms, and the new unsaturated radicals thus formed can be again saturated by the introduction of other radicals. In this way compounds can be built up containing sixty or more carbon atoms to the molecule. As the introduction of each additional atom of carbon makes a new compound it follows that the number of compounds of hydrogen and carbon is very great. Or again, the unsaturated residues of any of these hydrocarbons can be saturated by atoms of other elements, and in this way a vast number of substitution products can be formed.

Owing to the immense number of hydrocarbons and substitution products it is more convenient to consider them all together under the general head of Organic Chemistry, which has previously been defined as the Chemistry of the Hydrocarbons and their Derivatives.

Halogen Compounds.—In addition to the compounds formed from the hydrocarbons by the substitution of one or more halogen atoms for hydrogen, and which will receive consideration under organic chemistry, carbon forms compounds consisting only of carbon and a halogen. The most important of these is carbon tetrachlorid, CCl_4, formed by passing chlorin into chloroform. It is a transparent, colorless, aromatic liquid possessing anæsthetic powers similar to chloroform. Other halogen compounds of carbon are also known.

Oxygen Compounds.—With oxygen, carbon forms two compounds, the monoxid and the dioxid.

Carbon Monoxid, CO, or carbonous oxid, also improperly called carbonic oxid, is produced by the combustion of carbonaceous matter in an insufficient supply of air. It is also formed by the destructive distillation of organic matter, by the reduction of carbon dioxid or certain metallic oxids by means of heated charcoal, and by other methods.

When pure, carbon monoxid is a colorless, nearly odorless gas, condensible to a liquid only by great cold and pressure.

Ignited in the air it burns with a pale blue flame to form the dioxid. The blue flame seen hovering over a grate of red-hot coals is due to the burning of the monoxid.

When inhaled carbon monoxid operates as an active poison, combining with the hæmoglobin of the blood to form a very stable compound which cannot be broken up by the oxygen which enters the lungs, thus causing asphyxiation. The blood of persons poisoned by carbon monoxid possesses a bright purple-red color, which it retains for a considerable length of time when exposed to the air.

Theoretically carbon monoxid may be regarded as the anhydrid of formic acid, $HCHO_2$, for although this acid cannot be formed by dissolving the oxid in water, a formate can be prepared by passing it into an alkaline hydroxid, as in the following equation:

$$CO + KOH = KCHO_2.$$

Carbon Dioxid, CO_2, or true carbonic oxid, often improperly called carbonic acid, is produced whenever carbon is burned with a full supply of oxygen. It is produced naturally by the combustion and decay of organic substances, and exists in the waters of many mineral springs and in mines and caverns. Its compounds, the carbonates, and especially the calcium salt, form vast rock masses extending over great expanses of territory. The most convenient method of obtaining it for experimental purposes in the laboratory is by the decomposition of a carbonate by means of some stronger acid, as—

$$CaCO_3 + 2HCl = CaCl_2 + CO_2 + H_2O.$$

When pure, carbon dioxid is a colorless, odorless gas. The carbon being already fully oxidized, the gas is neither combustible nor a supporter of combustion.

It is heavier than air, and can be poured from one vessel into another. Water at 0° C. dissolves 1.79 its volume of the gas, the amount dissolved decreasing with the pressure. By cold and pressure the gas can be liquefied, and the liquid stored in steel cylinders may be transported from place to place. It finds a commercial use in the charging of fountains of the so-called "soda water," and in bottled ærated beverages.

Carbon dioxid may be regarded as the anhydrid of carbonic acid, H_2CO_3, though it is not likely that the acid can exist in the free state at ordinary temperatures, even in solution. Its salts, however, are an important class of compounds, and many of them are quite stable. On account of its weak affinity, carbonic acid can be displaced from its combinations by almost all other acids, the released carbonic acid immediately decomposing into water and carbon dioxid, while the latter escapes so rapidly as to cause effervescence.

While not distinctly poisonous, an atmosphere strong in the gas will not support life, for lack of the necessary oxygen.

Cyanogen Compounds—When mercuric cyanid is heated to a red heat it is decomposed into mercury and dicyanogen, $(CN)_2$.

$$Hg(CN)_2 = Hg + (CN)_2.$$

Dicyanogen may be regarded as the union of two univalent radicals of cyanogen, $CN — CN$, though these are not capable of existing separately.

Dicyanogen is a colorless gas, with an irritating odor somewhat resembling peach kernels, and is extremely poisonous. When ignited in the air it burns with a peculiar purple flame. By cold and pressure it can be liquefied.

Chemically the radical CN behaves like the members of the chlorin group, uniting with hydrogen to form an acid, or with the bases to form salts. In combination the formula CN is often changed to Cy.

Hydrocyanic Acid.—When a cyanid is treated with an acid, the released cyanogen instead of combining to form dicyanogen takes up the released hydrogen of the acid to form *hydrocyanic* or *prussic acid,* HCy, thus—

$$AgCy + HCl = AgCl + HCy.$$

This reaction is the alternative formula given in the U. S. P. for the preparation of *Acidum Hydrocyanicum Dilutum.*

The absolute acid is a colorless, mobile liquid, below 26° C. It is characterized by its intensely poisonous action, even a slight inhalation of the vapor being sufficient to occasion almost instant death. The pharmacopœial preparation contains two per cent. of the absolute acid.

On account of the uncertain strength of this acid the use of its salts in medicine is preferable. Three of these, the cyanids of mercury, silver and potassium, are official.

Hydrocyanic acid is a very weak acid, its aqueous solution not being acid to litmus, and is displaced from its combinations by even such substances as carbon dioxid.

The Double Cyanids.—The cyanids of the alkalies, or potassium cyanid, are capable of combining with the cyanids of some of the heavy metals to form an interesting class of double salts. Of these, two of the more important are potassium *ferrocyanid*, K_4FeCy_6, and potassium *ferricyanid*, K_3FeCy_6. The first may be regarded as consisting of a moleculue of *ferrous* cyanid united to four molecules of the alkali cyanid $FeCy_2$, $4KCy$, and the second as a molecule of *ferric* cyanid combined with three of the alkali cyanid, $FeCy_3$, $3KCy$.

By treating these salts with a stronger acid, ferro- and ferricyanic acids may be obtained.

Characteristic Reactions.—The organic compounds of carbon are distinguished by generally charring or leaving a residue of charcoal when heated on a platinum foil, or by yielding carbon dioxid when burnt with a full supply of air.

Carbonates are recognized by their effervescence with acids, and carbon dioxid by its yielding a precipitate of calcium carbonate when conducted into lime water. Hydrocyanic acid may be determined by its reaction with silver salts, or by its conversion into sulfocyanic acid, and the reaction with ferric salt, while the ferro- and ferricyanids are detected by their very characteristic reactions with any of the soluble salts of iron.

PRACTICAL STUDIES.

1. Place either sugar or starch on a platinum foil or small piece of tin, and hold in the flame of a gas or alcohol lamp by means of tongs or pincers. What is the black substance which is left behind?

Assuming the composition of the sugar to be $C_{12}H_{22}O_{11}$, what was driven off by the heat?

2. Place some starch in an evaporating dish, cover with strong sulfuric acid, and stir with a glass rod. Assuming the starch to have the composition $C_6H_{10}O_6$, what is removed by the acid?

3. Observe the action of a strong acid on a carbonate by placing some marble dust (calcium carbonate) in the bottom of a glass jar and adding some hydrochloric acid. Note the effervescence which takes place, and balance the equation—

$$CaCO_3 + HCl = CaCl_2 + CO_2 + H_2O.$$

4. Ascertain whether the gas is combustible or a supporter of combustion by introducing a burning splinter of pine.

5. Ascertain whether the gas is heavier than air by holding the mouth of the jar over the mouth of a test tube containing some clear lime water. (Do not tip the jar sufficiently to pour out the liquid it contains.) Tap the test tube gently and observe whether a white precipitate forms in it.

6. Add some solution of potassium cyanid to a solution of silver nitrate. What occurs? Pour off the liquid. Add more potassium cyanid to the solid residue. What takes place now?

7. Using dilute solutions add some solution of potassium ferrocyanid to a solution of ferrous sulfate. In another tube mix potassium ferrocyanid and ferric chlorid solutions, also dilute. Compare the results obtained, and also reserve to compare with the next experiment.

8. Repeat the last experiment, but using potassium *ferricyanid* instead of ferrocyanid.

LECTURE No. 34.

Botany.

By PROF. HENRY KRAEMER, Ph. G., Ph. D.

INTRODUCTORY.

The life of the world is contained and perpetuated in the animal and plant. Without either there are no manifestations of life. Of the two, the plant seems most independent and upon it the animal appears to be really dependent for its existence. The life processes in both the animal and plant are transacted through the same ground substance, viz., *Protoplasm*. In the very lowest animals and plants (i. e., those that show the least complexity of organization), the life processes are so much alike that it is indeed difficult to separate the animal from the plant. With the greater complexity of organization in the individual and the greater differentiation of the parts to serve the purposes of the organism we have higher forms of life. This complexity of structure and differentiation of parts go on until we have the highest forms of life. In the higher and highest forms of life it becomes comparatively easy to distinguish the plant from the animal, whereas in the lowest forms this distinction is sometimes not apparent.

Palæontology, or the study of ancient life as revealed in the earth's crust, teaches that in the earlier periods of the world's history, the life of the world was very different from what it is to-day. It seems reasonable to assume that all forms of life which exist on the surface of the earth to-day have arisen from that which preceded it. The idea that all forms of matter in the world have a connection with each other has been believed since ancient times. Even as far back as Anaximander (one of the Ionian philosophers) we find the germs of such a philosophy in nature. He believed that animal life arose through the power of the sun on the slime or mud; and that man was finally evolved through the fish and lower animals. Aristotle later believed that Fungi arose from the earth and that frogs developed from Fungi. Even until quite recently, the origin of the individual plant or animal has been shouded in mystery. Many experiments have been instituted to show that living forms of matter might arise from other than living matter. Cross, a wealthy Englishman, had an idea that natural electricity was conducive to the formation of life. He sealed jars and passed an electrical current through them and obtained some remarkable results. In one case he even obtained an insect.

There have been a great many able men who have advocated that certain kinds of life were not descended from parents. This is the theory of "Generatio spontanea," or spontaneous generation. This theory was first successfully attacked by Needham (1648,) who wrote that he had seen microscopic organisms springing into life. Spalazani (1706) found that if he made an infusion of meat and put it into a flask and sealed it no life developed. The objection was raised that he had deprived the contents of air and that hence no life could arise. Francis Reddi (1768) noticed that meats on putrefaction yielded maggots. He further noticed that flies were present and he got the idea that maggots were young flies. He took a tumbler and put some meat and water in it and covered it so that flies could not get in. He repeated the experiment after flies laid their eggs and found that flies developed therefrom, thus proving that they had ancestors.

It remained for Pasteur, during the last half of this century, to clear up the matter regarding the origin of individual microscopic organisms, and in doing so a new department of science, in fact a new world, so to speak, was discovered. He arranged an apparatus so that after all life had been killed in the fluid which was contained therein, air free from organisms might enter. The result was no life was produced. In other experiments he showed that only when micro-organisms were present—as yeast in grape juice—could life processes be manifest. The result of all investigations thus far has been to show that *there is no life without antecedent life*. In other words, wherever life arises there is an egg or a something corresponding to it produced by a parent from which the organism, be it plant or animal, very small or quite large, develops.

While it is now thoroughly proven that each individual arises from an egg, the question as to the origin of species still remains "the mystery of mysteries." By species and individuals are meant two entirely different things, and this must be made clear before going further. There may be more individuals than there are species, i. e., there are more individual white oak trees than there are species of oak. This brings us to consider at the outset the principles involved in the naming of plants. We see individuals in both the plant and animal kingdom that show a kinship. The resemblance and relationship, for instance, in the blossoms, fruits and other characters of an apple tree and a pear tree are apparent to all who observe them. The blossoms of the pear and apple further resemble somewhat those of the peach, cherry and rose; although the fruits of all are quite different. While there is a relationship, still the separation is much wider. If we compare all of these with the pea, violet, marshmallow or buttercup, we shall see a still more distant relationship or, in fact, no kinship at all. Plants that are separated from each other by apparent characters of difference, and that show readily that they are not related, are put in groups or orders, called *natural orders*, by themselves. For instance, the apple, pear, peach, cherry and rose belong to one order and called Natural Order Rosaceæ. The marshmallow belongs to Malvaceæ; the violet to Violaceæ; the buttercup to the Ranunculaceæ, etc. Now the different natural orders are like so many different turns with varying number and kinds of families and inhabitants. In the natural order (or town, we might say) of Rosaceæ then are the following individuals: Apple, pear, peach, cherry, rose, etc. Now, all of these may belong to the same or to different families. These common names for plants and animals are like the personal and nick-names as Joe, Jean, etc. We do not know from these names to what family they belong. Consequently by reason of necessity, just as human beings, so to plants and animals are given family names. The apple and pear belong to the same family and have received the family name Pyrus. These are further distinguished from each other by the individual or specific name. The pear is called *Pyrus communis;* the apple is termed *Pyrus malus*. In other words, just as the family as well as individual name of Joe may be Joseph Smith, so the whole name of pear is Pyrus communis. We speak of the name *Pyrus* as being the generic or genus name and *communis* as the specific or species name. It is to be noted that the generic name is always written first and with a capital, whereas the specific name follows the generic name, and may or may not be written with a capital. The rules regarding this subject may be seen in the introductory portion of the U. S. Pharmacopœia. We have therefore in botanical nomenclature thus far considered the following points:

Natural order.	*Genus.*	*Species.*	*Common name.*
Rosaceæ,	Pyrus,	Malus,	Apple,
"	"	Communis,	Pear,
"	Prunus,	Serotina,	Wild-cherry,
Malvaceæ,	Althæa,	Officinalis,	Marshmallow,
Violaceæ.	Viola.	Tricolor.	Pansy.

Now the name of the person who describes a plant is affixed to that of the species described. Linné, described the marshmallow and consequently we have the name of the plant as *Althœa Officinalis Linne*. Under Prunus Virginiana in the U. S. P. we find "the bark of *Prunus serotina Ehrhart*," etc.

In the animal kingdom there is employed a little different classification. It is divided into 10 sub-kingdoms, in each of which there are 5 subdivisions, as in the S. K. Vertebrata, we have:

Class........	Mammalia,	Mammalia,	Mammalia,
Order........	Carnivora,	Carnivora,	Carnivora,
Family.......	Felidæ,	Felidæ,	Canidæ,
Genus........	Felix,	Lynx,	Canis.
Species.......	Domestica,	Rufus,	Familians.

The number of distinct species in both the plant and animal kingdoms is very large and not easily to be computed with authenticity. The question arises how did so many different forms of life come to being. Agassiz and others believed each animal and plant to be of an independent creation. The labors of Charles Darwin and many others, on the variation of the plant and animal under domestication, make it seem possible that there has been a gradual evolvement from the lowest forms of life to the highest. Two things are certainly clear to all observers, viz: (1) that some characteristics of the parent are in each offspring and (2) that no offspring is just like its parents. This allows room for an opportunity for variation in nature to take place. Gardeners, breeders, etc., take advantage of this tendency to foster the changed conditions that both plants and animals assume when placed under varying conditions. Indeed totally different products are finally produced by caring for those forms especially desired. In nature in the course of time similar changes are supposed to take place.

There is a much larger production of seeds than of plants that reach maturity. There is a battle for existence taking place throughout nature. Both animals and plants struggle for their existence. In this struggle they see to it that they produce just the kind of structures which will enable them to survive and produce seed. We observe that species vary, not only according to the different conditions under which they grow, but also according as the competition and struggle is keenest. Changed conditions cause an alteration of structures in the individual, and the result is that the individuals of a species become so changed that no kinship is apparent. If this tendency to variation is held firmly in mind, it does not become difficult to conceive that the simplest method for the production of so many different genera and species is one by which the individual, without regard to its ancestry, labors by every means within its power to produce these structures by which it can most effectively fulfill its life work.

Now, just as man selects the forms of plants or animals best adapted to his purposes and most pliable in his hands, so in nature there is a selection which takes place in "the survival of the fittest," or "a natural selection." There is this difference, however, "man selects only for his own good; nature only for that of the being which she tends." Each plant and animal does the best it can to fulfill its mission in the surroundings in which it is placed. It endeavors to mature and to produce seed. If the conditions are favorable it improves its own structures first as to size, strength, etc., and then it will, generally speaking, produce corresponding seed. If there are chances that its existence may be terminated suddenly and unexpectedly, it will be more or less dwarfed, but still produce seed, as herbaceous plants growing in forests. Only those forms of life that are able to contend against the surrounding conditions of nature succeed. In the struggle changes by reason of adaptation are produced in the individual, and each distinct species may be considered to be an accumulation of the results through time of the adaptation of the progeny or offspring, having a common origin and which existed centuries or ages ago. The characteristics that the individual assumes as well as those that survive, are to be considered as the most profitable ones for its preservation and the fulfillment of its mission under the conditions in which it lives. The affinities of all beings of the same class have been represented by a tree. "The green and budding twigs may represent existing species; and those produced during former years may represent the long succession of extinct species. At each period of growth all the growing twigs have tried to branch out on all sides, and to overtop and kill the surrounding twigs and branches, in the same manner as species and groups of species have at all times overmastered other species in the great battle for life. The limbs divided into great branches, and these into lesser and lesser branches, were themselves once, when the tree was young, budding twigs; and this connection of the former and present buds, by ramifying branches, may well represent the classification of all extinct and living species in groups subordinate to groups. Of the many twigs which flourished when the tree was a mere bush, only two or three, now grown into great branches, yet survive and bear the other branches; so with the species which lived during long-past geological periods, very few have left living and modified descendants. From the first growth of the tree, many a limb and branch has decayed and dropped off; and these fallen branches of various sizes may represent those whole orders, families and genera which have now no living representatives, and which are known to us only in a fossil state. As we here and there see a thin, struggling branch springing from a fork low down in a tree, and which by some chance has been favored and is still alive on its summit, so we occasionally see an animal like the Ornithorhynchus or Lepidosiren, which in some small degree connects by its affinities two large branches of life, and which has apparently been saved from fatal competition by having inhabited a protected station. As buds give rise by growth to fresh buds, and these, if vigorous, branch out and overtop on all sides many a feebler branch, so by generation it has been with the great Tree of Life, which fills with its dead and broken branches the crust of the earth, and covers the surface with its ever-branching and beautiful ramifications." (Darwin.)

DEPARTMENTS OF BOTANY.

There are some people who think that when one has taken up the study of plants one has, like the nun, taken the veil that shall shut one off from the life of the world. Very few realize that in the life of the plant is the life of the world, in a certain sense, as we shall see later. Botany is the department of science which has for its object the study of plants. He who studies or works with plants to get the most out of them is a botanist. Generally speaking, the term botanist is limited to those persons who have had some training in the study of plants and who devote some time subsequently in the study thereof. In the broadest sense, every one who, whether by inclination or necessity, works with plants to arrive at a better knowledge of them is a botanist. The science of botany may be divided into two great departments, viz.: I. *Pure Science* of Botany; and II., *Applied Science* of Botany. To have an intelligent idea of the latter one must understand the underlying principles of the former.

I. The Pure Science of Botany may for our purposes be divided into the following departments:

(1) *Outer Morphology* being the department that concerns itself in the study of the external characteristics of the plant and the elements which make it up.

(2) *Inner Morphology* (Histology, Anatomy) being the study that follows upon *outer morphology* and treats of the inner structures of the plant and its elements.

(3) *Physiology* is the department which has for its object the study of the functions of the plant and the elements which comprise it.

(4) *Systematic Botany* is the study which has for its object the naming of plants and arranging them in their proper places, i. e., genera and natural orders. Formerly systematic botany was based upon the study of outer morphology (called either organography or simply morphology), but to-day all of the other departments of scientific botany have a share in the classification of plants.

II. The Applied Science of Botany or Economic Botany, includes the following departments:

(1) *Agricultural Botany* being the department as related to the study of plants which yields us food products. This may be further subdivided into:

(a) Agrostology, study of grasses.

(b) Agricultural chemistry, chemistry of soils, plants, etc.

(c) Pomology, study of fruits.

(d) Forestry, study of trees and forests.

(2) *Aesthetical Botany* being the department having for its object the study of plants from the side of the beautiful by reason of their æsthetical qualities. This may be further subdivided into:

(a) Floriculture, culture of flowers.

(b) Horticulture, cultivation of gardens.

(3) *Medical or Pharmaceutical Botany* is the department which treats of plants from the standpoint of their sanitary qualities and their application in the cure of disease. It is from this department that we shall view the subject of botany. As has been already intimated in order to understand any of the departments of applied botany a thorough understanding of the principles of the pure science is necessary. We therefore first consider the principles of the different departments of the pure science of botany.

(To be Continued.)

HOLIDAY VACATION FOR ERA STUDENTS.

As announced in the prospectus, there will be a two weeks' intermission in the lectures, covering the holiday season. During this period no lectures will appear, but students who may find time hanging heavily upon their hands are advised to make a careful review of the subjects already studied, in anticipation of the first written examination which is to follow the completion of the portion of the course included in Section A. Students who for any reason have not been able to keep up with their quizzes are urged to make use of the intermission to bring up all arrears of work and get ready to take a fresh start promptly upon the appearance of the next lectures.

TONIC FOR ALCOHOLICS.—A correspondent of the Journal of the American Medical Association writes that the tonic used in all the cure establishments is:

Fl. ext. coca,
Fl. ext. gentian,
Fl. ext. black haw........................āā ℥ ij
Dilute alcohol q. s. ....O j

Sig. F. ʒ j every four hours in warm water.

This is the tonic. Ipecac added to this will produce nausea, and is tasteless. The more ipecac the more nausea. This will in time disgust a patient and produce a dislike for liquor. The ipecac is added after drinking, without the knowledge of the patient. A hypodermic of apomorphia, one-tenth grain, a short time after drinking, will produce excessive vomiting. The patient must not know the cause of the vomiting. These things can be worked in the tonic without arousing the patient's suspicion; thus the trick of these institutions. The hypodermic is used when a tonic is given hypodermically, on some pretext, after drinking.

FUCUS CRISPUS AS EMULSIFYING AGENT.—A decoction of the drug is made by boiling 15 gm. with 1,300 cc. water. In 150 gm. of decoction 25 gm. sugar are dissolved and this shaken with 80 gm. cod liver oil. The drug may also be used in making emulsions containing alcohol.—(Ap. Ztg.)

NATURAL AND ARTIFICIAL PERFUMES.*

BY M. JACQUES PASSY.

We may divide the makers of perfumes into the two classes of those who furnish the raw materials for perfumery and the manufacturers proper. The former provide the essences, the pure or concentrated scents, and the latter mix and extend them, incorporate them into various liquids or pastes, and offer them for consumption. Another division, of recent occasion, may be made between those who extract natural perfumes according to the methods pursued for centuries and those who use chemical processes or make artificial perfumes; for, as dyestuffs are now composed from coal-tar products to the extent that some of the natural materials have been driven out by artificial substitutes, so a number of perfumes have been in like manner synthethized. But there is no probability that the synthesis of perfumes will ever be carried to the extent of which that of dyes seems capable, because, first, some essences are the raw material for the synthesis of artificial products of much greater value; and, secondly, the chemical problem of the synthesis of perfumes is more complicated than that which enters into the artificial production of coloring matters.

The preparation of natural essences is still a genuine agricultural industry. Flowers and leaves are the raw material, and they have to be treated fresh. The original laboratories are therefore generally established very near where the plants can enjoy the most favorable climatic conditions. Hence the crude essences generally come to us from various distant regions—essence of ilang from Manilla, of geranium from Réunion and Algeria, of lemon and citron from Ceylon and China, etc. But as the imported materials are generally scandalously adulterated, European manufacturers have been impelled to bring home such of the crude material as will bear transportation. So sandalwood, cloves, patchouli leaves, and vetivert-grass roots brought dried and with their scents unimpaired are distilled in France and Germany rather than in the countries of their origin.

The most important center of this manufacture is the little city of Grasse, near Nice and Cannes, which, besides being a large center of production for the distillation of plants and woods, is the chief place where these special processes which have been transmitted through ages and are the only one for the extraction of the perfumes of flowers are in use. The only chemical agents employed in these processes are vapor and fat.

The manufactories of artificial perfumes, on the other hand, are real laboratories of chemical products where the habitual agents of chemical industry are employed, requiring the intervention of chemists and engineers, and are established by preference at the great industrial centers. Hence good reasons exist for these two branches having been kept apart,' although it is not certain that this separation will continue permanent.

The simplest process of extraction is by distillation. The flowers or leaves are put into the retorts with water and heated to the proper degree. The perfume passes over to the cooling apparatus with the vapor of the water and is condensed with it, after which it is separated from the water by taking advantage of the difference of density. The heat is applied by means of vapor under pressure. Formerly fire was applied directly, but the amount of production was insignificant compared with what it is now; this method is, however, still in use in small portable apparatus. Some distillations are literally performed on the spot, as those of certain aromatic plants which are not grown very near Grasse, the finer lavenders especially being found wild at considerable heights on the mountains. The communal lands up there are allotted every year, and extractors who make this a specialty establish themselves in their plots with their direct fire apparatus, expecting to dispose of their production to the large houses.

When the quantity produced is regarded, distillation is the most important branch of the perfumery industry. It is simple, inexpensive, requires but little manual labor, and is applicable to large quantities of material. But there are objections to it, and some of them are of so much force as to have led to the substitution for it of seemingly more primitive, and at all events, more expensive, methods of extraction. The first objection is the liability of vapor, coming in contact with some of their more unstable constituents, to change the character of some of the essences. A still more important objection is that the vapor may bring over some undesirable constituents existing in the plant, or by its action on some of the constituents may produce new substances in no way allied to the perfume. Impurities produced in this way communicate to the newly distilled essence what may be called the taste of the retort. Such inconveniences, of relatively little account in the coarse extracts, are very important in the more delicate distillations.

A process used at Grasse for conserving the more delicate qualities of the perfumes, and which constitutes a method original to the Maritime Alps, consists in the employment of grease for the composition of perfumed pomades. A grease of suitable consistence which will not become rancid is obtained by preparing a mixture of lard and beef fat and subjecting it to thorough refining processes. The perfume is incorporated with this base by a process of warm maceration, or by absorption.

For maceration the fat is melted in the marine bath and brought to a temperature of 60° or 70° C., as measured by the skill of the attendants rather than by the thermometer; the rose leaves, or whatever is to be treated, are introduced, thoroughly immersed; after a few hours the mixture is passed through strainers and drained, so as to separate the grease from the flowers as completely as possible. What grease remains on the rose leaves is washed off with warm water. The process is repeated with the same grease and with other flowers, and so goes on for fifteen or twenty days, according to the quality of the pomade that is desired. Some of this pomade is consumed as it stands; but by far the greater part is used for making extracts, or alcoholic infusions of the perfume. For this purpose the pomade is introduced with a suitable quantity of alcohol into a shaker, consisting of a cylinder in which a screw beater is kept going all the time. The mixture is thus actively beaten up, and, as the perfume has more affinity for the alcohol than for the grease, the grease at times becomes inodorous, and the alcohol is charged with the greater part of the perfume. The grease is then sent to the soap maker, for it is not fit to be used again for a pomade.

The question may be asked, and has been asked, Why use the intervention of grease in the process of extraction? Why not apply alcohol or some substance of similar powers directly? Chemists have offered ether, sulphide of carbon, chloride of methyl, chloroform, and other scientifically prepared solvents, to have them rejected, and have blamed the manufacturers of Grasse for adhering to barbarous processes, and for their inability to escape their antiquated routine. A more scientific spirit would lead them to inquire if there were not some reason for preferring grease. Most of the substitutes recommended have more liberal affinities than grease. Alcohol, for instance, unites readily with water, and with water takes substances held in solution by it, which are extremely undesirable in a perfume; and so with the other substances, according to their several properties. Grease has a narrow elective affinity, and takes just what is wanted and nothing else. Various petroleum substances have been proposed recently as extractors, and much may be said *prima facie* in favor of them; but experiments with them have not yet given satisfactory results.

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* Translated for the Popular Science Monthly from the Revue Scientifique.

In the process of absorption or *enfleurage*, wooden frames furnished with glass bottoms are used. These, fitting closely together, are placed one upon another, so that a small inclosed space is left between every two of them, or a sort of greenhouse with glass above and below, inclosed with wood. The surfaces of the glasses are coated with grease, on which a layer of flowers is placed. The flowers are left there to share their perfume, which is absorbed by the grease, for twenty-four hours, when they are removed and new flowers are put in their places. This is continued for two or three months, at the end of which time the pomade is ready for treatment as in the maceration process. The flowers to which this process is best adapted are the jasmine, tuberose, and mignonette. This *enfleurage* process has likewise drawn criticism, if not contempt, from men of science; and the question has been asked why a different treatment is given to those than that pursued with other flowers.

If we observe flowers with regard to their odors, we shall find that they may be divided into two categories; those which contain their perfume already formed, or have at least a considerable reserve of it, and those which have no reserve, but develop and emit their fragrance as they grow. When we rub roses, or orange blossoms, for example—flowers of the former class—we perceive their fragrance very plainly. Such flowers may be treated by distillation, by the warm pomade process, or by extraction with volatile solvents, with results of a greater or less degree of perfection, but always positive; while if we rub a flower of jasmine, convallaria, or violet—which are of the second class—we perceive nothing but a slight pungent odor in the same plant which an instant before was exhaling a pervading fragrance. In crushing it we have killed it, and it produces no more perfume. Such flowers are not suitable for distillation or maceration or the action of volatile solvents, because there is nothing to be extracted from them.

The production and exhalation of odor go on while the plant continues to live and vegetate, even after it has been cut. When, therefore, it is placed in the limited atmosphere of these absorbing cases, the perfume continues to be given out, and is absorbed by the grease. Contemplating the matter from this point of view, we are astonished at the sagacity of the perfume extractors of past ages, which enabled them to perceive that some flowers could be treated only by this absorption process, and to co-ordinate their operations so logically that the method could not have been better adapted to its purpose if it had been adjusted after a careful study of the physiological principles involved. Everything in the process seems adapted to the prolongation of the life of the flower. The close and consequently moist atmosphere in which it is placed preserves it against dying; the coolness of the apparatus prevents its wilting. The flowers of the tuberose are picked just as the bud is about to open. It blooms within the case, and gives out nearly all its perfume there.

We draw from these observations the two lessons that the extraction of natural perfumes is not, as is often believed, a question of pure chemistry, but is primarily one of vegetable physiology; and that in this domain, as in many others, practice is often in advance of theory. For my own part, I have never met with well-established processes sanctioned by long use which do not rest upon correct though frequently unconscious observations over which theory has nothing to boast.

As when people wanted to travel faster they devised the railroad instead of improving the stagecoach, so the achievements of chemistry in the domain of perfumes have not been made in building up the old industry, but through creating another. To enumerate and describe the artificial products now used in perfumery would be like composing a manual of chemistry. It will be of more interest to indicate a few categories of syntheses or chemical fabrications, and to point out the various chemical or financial questions they raise, illustrating them severally by typical examples described in detail.

There are several kinds of synthesis. One kind consists in isolating a natural principle, studying it, and trying to reproduce it. Such a synthesis may be called a methodical one, as following out a line traced from the beginning. Take, for example, the synthesis of ionone, or artificial violet. The authors of this synthesis, MM. Tiemann and Krüger, started with the natural perfume of iris root, which they found to be very characteristic and fixed. It was consequently considered to be a single very definite and stable substance. All these conditions were favorable. The preliminary researches of the authors showed that this substance existed in extremely weak proportions in iris powder. The proposed synthesis, therefore, promised to be lucrative; for, while all chemical syntheses are interesting, the probable financial bearing of the discovery is of considerable importance; and it is not the absolute cost but the probable profit that most deserves consideration. A primary characteristic of perfumes is their immense strength; a very minute quantity of one is sufficient to produce a large effect. Consequently, they may bear a large price without limiting consumption. But, to isolate this as yet unknown perfume, it was necessary to treat enormous quantities of iris powder, and this required industrial resources which the inventors could not command. These were secured by making suitable arrangements with two large houses which became parties in interest. The experiments lasted ten years. First, irone, the principle to which the odor of the violet is due, was isolated. A complete chemical study of it was made. Having remarked that citral, an aldehyde abundantly diffused in Nature, gave, on condensation with acetone, an acetone of the same crude formula as irone, these authors effected this condensation under the influence of hydrate of baryta. They thus obtained, as they had expected, an acetone of the same crude formula as irone—false irone—this, it is true, had neither the odor nor the properties of irone; but by the action of dilute sulphuric acid it was transformed into its cyclic isomer, ionone. From the chemical point of view, ionone not being identical with irone, but only an isomer, the problem could not be said to be solved; but it was fully solved from the industrial point of view. Ionone possesses, like irone, the perfume of the violet, with a slight shade perceptible to practiced noses, but lending itself admirably to all the uses of perfumery. We have in this a complete example of methodical synthesis, although it must be admitted that the authors were aided by happy combinations of circumstances that might not always occur.

There are also chance syntheses. Thus, a substance, the odor of which may be utilized, is sometimes fallen upon in pursuing researches undertaken for another purpose. This is what happened, for example, in the case of Baur's artificial musk. M. Baur had undertaken the study of two carbides of hydrogen—two butyltoluenes contained in the essence of resin. He isolated and separated these substances, and then in experiments connected with the performance of the synthesis he perceived an exceedingly pronounced odor of musk appertaining to the trinitrile derivative of isobutyltoluene. M. Baur was not led to his researches by chance, but the discovery of his musk, the most precious result of them, was not anticipated by him.

There are other cases in which a series of bodies are prepared with full expectation of what the chemical results will be, but without knowing what odor they will have, or whether they will be odoriferous, but with the expectation that they will be, and that some may be found among them the odors of which can be utilized.

Syntheses of this kind only rarely lead to natural principles; more frequently what perfumers call chemical products are obtained, or perfumes which betray their origin to a greater or less extent, and can not be used in the preparation of the finest products, but have cheapness and great strength in their favor. We should observe that chemical synthesis takes to the odorous principle itself, while essences contain only a very slight proportion of the active substance.

Finally, it sometimes happens that no new material is discovered, but some laboratory reaction already known is turned to industrial use. Such is the case with heliotropine, formerly known as piperonylic aldehyde or piperonal; terpineol, or white lilac; anisic aldehyde, or hawthorn, etc.

Twenty-five or thirty years ago it was believed that with a few well-known exceptions, such as those of bitter almonds, anise, mustard, and some others, the essences were constituted of hydrocarbons, $C_{10}H_{16}$ in indefinite numbers, all isomeric and similar to spirits of turpentine. Our views on this subject have been considerably modified. It has been found that the hydrocarbons or terpenes contained in essences may be referred to well-defined species possessing characteristic reactions and derivatives, some of them crystallizable, by which they may be distinguished. Oxidized principles have been isolated in essences related to the fatty stearines, capable of facile transformation into cyclic derivatives, which may be regarded as connecting links between the fatty and the aromatic series. Frequently a natural essence represents a harmonious mixture of various combinations. Oil of bergamot, having a composition of this character, possesses an odor vastly more characteristic than any of its components taken separately. And it sometimes happens that compounds suitable for fine perfumery, if they were pure, are spoiled by the presence of disagreeably smelling substances. The elimination of such principles, or the refining of such perfumes, has given rise to a second branch of our chemical industry.

The discoveries that have so far been made are quite insufficient to explain the composition and odor of essences. We find certain substances, like linalool and geraniol, common constituents in essences of the most different characters, and are hence forced to recognize that in a great number of cases they are only the vehicle, the substratum, of the really characteristic perfume; and we begin to suspect the presence of still rarer principles corresponding probably with a more differentiated, more specialized organism, and related to the specific characteristics of the vegetable cell.

POSOLOGY OF POTASSIUM BROMIDE FOR INFANTS.—A French physician has compiled the following table of doses:

	Grains per diem.
Under 3 months	¾ to 1½
3 to 6 months	about 3
6 months to 2 years	4 to 6
Over 2 years	15, 30, 45
3 to 4 years	15 grs. to 2 drachms

2½ drachms is given as the maximum single dose for a child 12 years old.

A suitable formula for administration of potassium bromide is appended:

Potassium bromide	15 grains
Essence of orange	10 drops
Water, sufficient to make	3 fl. ounces
Syrup of bitter orange peel	1 fl. ounce

ANCIENT EYE REMEDIES.—A discovery has just been made in the archives of the Vatican. It is a collection of medical prescriptions for diseases of the eye, in the hand writing of Michaelangelo. He was much troubled with his eyes in old age, and he seems to have made a record of all the remedies which were prescribed for him.—Sci. Am.

BROMALINE, or bromethylformine, is employed in epilepsy and has the advantage of not producing bromism. It is crystalline and dissolves in water.—(Ph. Post.)

PHARMACY.

METHYLLORETIN.—An antiseptic appearing in bright yellow needles or plates. Insoluble in all liquids.

FORMOCHLOR.—A solution of formaldehyde and calcium chloride. Used as a disinfectant by means of an atomizer.

ANTISEPTIC POWDER.—Borax and alum, of each 50 parts; phenol, menthol, thymol, oil of eucalyptus, oil of wintergreen, of each 5 parts.—(Ph. Ztg.)

REMEDY FOR ASTHMA.—Tincture of opium, 5 parts; ether, 10 parts. Fifty drops every half hour until relieved.—(Ph. Ztg.)

LOREMIT (p-iod-ana-oxyquinoline-o-sulfonic acid), is an antiseptic which crystallizes in yellow plates or needles, dissolves in water and forms stable salts.

VALIDOL, a combination of menthol and valeric acid, is a clear, colorless, syrupy liquid of agreeable odor, of refreshing and faintly bitter taste. Useful in hysteria and epilepsy.—Ph. Post.)

BISMUTHOXYIODIDE PYROGALLOL is in the form of a very fine amorphous powder of yellowish red color, unaffected by all ordinary solvents, air or light. It has a decided antiseptic power.—(Ph. Post.)

QUININE CARBOXYLIC ALKYL ESTERS are formed by the action of chloroformic alkylesters upon quinine in presence of a suitable diluent. Antipyretics without bitter taste.—(Ph. Post.)

TANNERIN consists of 1 part carnauba wax and 3 parts oil of turpentine melted together. The mass is mixed with coloring matter and placed on the market as yellow, brown or black shoe polish.—(Ph. Post.)

PRESERVATIVES FOR MILK, CHEESE AND BUTTER.—Two preparations have recently been put on the market, one consisting simply of borax, the other of common salt, potassium nitrate, borax and formaldehyde.—(Ap. Ztg.)

OREXIN TANNATE is a salt that has been found valuable as a stomachic for children. It is a yellowish white powder without odor and taste, insoluble in water, easily soluble in dilute acids, particularly hydrochloric acid.—(Ap. Ztg.)

GUAIAQUINE is obtained by a reaction between guaiacolsulphonic acid and quinine. It is a yellow powder, easily soluble in water, alcohol and dilute acids, nonodorous and noncaustic. Expected to replace guaiacol.—(Ph. Centralh.)

ADULTERATED WAX.—Samples of white and yellow wax from a large lot of Domingo product, purchased in London and offered at a low price in Germany, were found to be only about one-third wax, the rest being paraffin and ceresin.—(Ph. Ztg.)

MENTHOL-COLLODION is recommended to relieve the pain of skin abrasions and bruises. Before applying it the parts are washed with lukewarm water and moistened with ether. The preparation is composed of 4 parts collodion and 1 part menthol.—(Ph. Post.)

PRODUCTION OF CAMPHOR.—The camphor tree is found outside of Formosa only in Japan and a few East Indian islands. The export of camphor last year from Formosa alone amounted to two and a quarter million dollars. The value of the total export during the same time was eleven and a half millions.—(Drog. Ztg.)

QUESTION BOX

The object of this department is to furnish our subscribers and their clerks with reliable and tried formulas and to discuss questions relating to practical pharmacy, prescription work, dispensing difficulties, etc.

Requests for information are not acknowledged by mail and ANONYMOUS COMMUNICATIONS RECEIVE NO ATTENTION; neither do we answer queries in this department from non-subscribers.

Aristol.

(Willow.) See this journal, Dec. 2, 1897, page 839.

Silvering Mirrors.

(W. C. Z.) See this journal, July 23, 1896, page 111, and Sept. 24, 1896, page 402.

Tasteless Castor Oil.

(P. M. B.) See Era, July 30, page 141; Sept. 17, page 371, and Oct. 29, 1896, page 567; also May 20, 1897, page 599.

Peruna.

(H. E., Jr.) Some information furnished by the manufacturers is published in this journal, April 11, 1895, page 477. We cannot give the formulas for proprietary medicines.

Glycerine Tonic Compound.

(U. S. K.) The manufacturers of this preparation state that it contains "glycerin, sherry wine, gentian, taraxacum, phosphoric acid, carminatives." We cannot give the formula.

Bleaching Wool Fat.

(F. F. H.) We know of no satisfactory process for bleaching wool fat upon the small scale. Anhydrous wool fat becomes colored upon exposure to the action of light, air and moisture, and it should, therefore, be kept in small containers, suitably protected.

Practice of Pharmacy in Northwest Territories.

(H. L. S.) See issues of this journal, Sept. 30, and Oct. 7, pages 461 and 503, respectively. Why do you not write to the registrar, Secretary of the Pharmaceutical Association of the Northwest Territories, A. D. Ferguson, Wolseley, N. W. T., and get your information first hand?

Rectifiying Kerosene.

(SALOL.) There is a fortune awaiting the man who can invent a "practical method of obtaining a colorless, tasteless and odorless liquid from kerosene." Various attempts at rectification have been made, but none of them has successfully produced a liquid of the character you outline. Some information on the subject may be found in this journal, March 4, 1897, page 473.

To Fix Crayon Painting On Silk.

(J. H. B.) Spray upon the design with an atomizer a volatile copal varnish like this: Fine copal broken small, 12 parts; ether, 2 parts; alcohol, 12 parts; oil of turpentine, best quality, 8 to 9 parts. A simple varnish which may be applied with a pencil is: Mastic, 3 ounces, dissolved in 1 pint of alcohol.

Menthol in Oil of Peppermint.

(Salol.) The total menthol content of oil of peppermint, i. e., the percentage proportion of alcoholic constituents either in the free state or as esters, is placed by Power and Kleber as follows for the different varieties: American, 45 to 60 per cent.; English, 58 to 67; Japanese, 60 to 77. The latter oil is not much used medicinally on account of its peculiar bitter and disagreeable taste.

Elixir Phosphate of Iron, Quinine and Strychnine.

(Pharmacist.) There is always more or less trouble with this preparation. The proportions and combinations of medicinal principles, vehicle, etc., are so nicely adjusted that any little alteration, especially the addition of water, is apt to cause precipitation. All preparations containing phosphate or pyrophosphate of iron are very susceptible to the action of light. However, as none of the dozen or more formulas you have tried has proven satisfactory, we suggest you "pin your faith" on the formula offered by the revised edition of the National Formulary. It differs considerably from that in the first edition and it has received much favorable comment. It also has the prestige of semi-official authority.

Extract of Malt.

(Phm. B.) Under this name two distinct preparations have been put on the market, one being a very strong beer, the other an extract prepared from malt and chiefly composed of dextrin and glucose, with some albumen and phosphates. Various preparations of malt, or of malt extract, combined with other ingredients, such as iron, quinine, pepsin, hypophosphites, oil, etc., and which are commercially known as "malt extracts," are proprietary preparations and, of course, their formulas are known only to their respective manufacturers. Considerable information upon the preparation of malt and allied products is given in the dispensatories. For the chemistry of malting, see Sadtler's "Handbook of Industrial Organic Chemistry," or Blount and Bloxam, "Chemistry for Engineers and Manufacturers," Vol. II., "Chemistry of Manufacturing Processes."

Emulsion Linseed Oil, Thomson.

(T. S.) The following is the formula you desire:

Linseed oil	3¾ fl. ounces
Oil wintergreen	½ fl. dram
Oil cinnamon	½ fl. dram
Acacia, powder	2 ounces
Water	6 fl. ounces
Glycerin	1¼ fl. ounces
Simple syrup	2½ fl. ounces
Hydrocyanic acid, dilute	40 minims

Triturate the mixed oils with the acacia, add 3 fluid ounces of water, triturate until emulsified, add the syrup, glycerin, acid, and the remainder of the syrup and mix well.

A formula in which infusion of linseed is used is the following from the Era Formulary:

Chlorodyne	45 minims
Oil of anise	4 minims
Tincture tolu	½ ounce
Tincture senega	½ ounce
Vinegar squills	1½ ounces
Infusion linseed, enough to make	3 ounces

Add the oil of anise in the tincture of tolu, to the vinegar of squills and mix the other ingredients by shaking. Dose, 1 to 2 drams.

Liquor Ferro Mangani Peptonati.

(Willow.) Here is a formula recommended by the Berlin Apothecaries' Society:

Iron peptonate (25 per cent. iron)	24.0 grams
Liquor manganese glucosate (2 per cent. manganese)	50.0 grams
Solution soda, sp. gr. 1.170	10.0 grams
Syrup	200.0 grams
Alcohol, 90 per cent.	100.0 grams
Tincture orange	3.0 grams
Aromatic tincture	1.5 grams
Tincture vanilla	1.5 grams
Acetic ether	5 drops
Distilled water, enough.	

Dissolve the iron peptonate in 200 grams hot water; allow to cool, then add first the syrup, soda solution, and then 90 grams distilled water, whereby the precipitate, previously formed, is redissolved. To the manganese glucosate add a few drops of solution soda, to render faintly but distinctly alkaline, and add this to the preceding solution. Finally add 320 grams of distilled water, then the alcohol, and lastly the flavors. This preparation contains 0.6 per cent. of metallic iron and 0.1 per cent. manganese. Its reaction is alkaline.

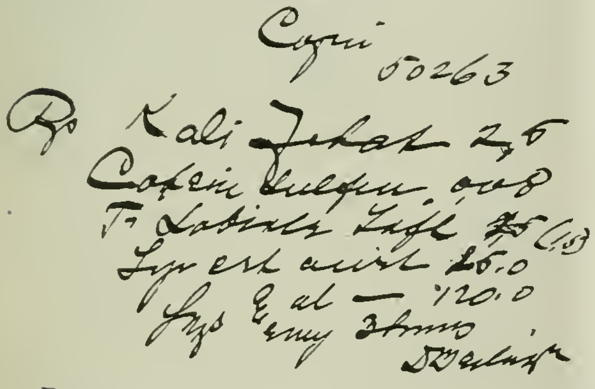
See also this journal, Oct. 17, 1895, page 496, and Aug. 26, 1897, page 372.

Egg Emulsions.

(J. H. P.) We cannot give the formula for the preparation you name. However, yelk of egg has long been known as an excipient in emulsions, particularly when acids or large proportions of alcoholic liquids are to be added. According to Caspari, one yelk from an egg of average size will suffice for 1 fluid ounce of a fixed oil or of ½ fluid ounce of a volatile oil; in place of the simple yelk, the official glycerite of yelk of egg, also known as glyconin, of which ½ fluid ounce is necessary for an ounce of fixed oil, has been used with decided advantage. In either case the oil should be added in small quantities to the yelk of egg or glyconin, previously rubbed smooth in a mortar, each portion being thoroughly incorporated before another addition is made; if the mixture should become inconveniently thick, a small quantity of water may be introduced, and after all of the oil has been emulsified the prescribed amount of water is added, likewise in divided portions, with constant stirring. The readiness with which yelk of egg unites with fixed oils is due to the fact that it is a natural emulsion of an oil and albuminous matter. The emulsifying power of one fair-sized egg is equivalent to about 10 grams of gum arabic, or 1.25 grams of tragacanth (Coblentz). A typical formula for a preparation of this character may be found in the National Formulary, page 47.

Prescription Reading.

H. H. Breuer, Brooklyn, N. Y., sends the following translation of the prescription submitted in the issue of this journal, Dec. 9, 1897, page 866:



℞

Kali iodat.	2.5
Codein. sulfur.	0.08
Tr. Lobeliæ infl.	1.5
Syr. cort. aurant.	25.0
Aq.	ad 120.0

M. Sig. ʒss. every 3 hours.

Dr.——

Artificial Oil of Rose.

(J. H. P.) There are several artificial preparations known in chemistry possessing an odor somewhat like rose and rose geranium. Among these Sawer names the following: Ammonium salicylite—prepared by agitating salicylol (oil of spiræa Ulmaria) with strong aqueous ammonia at a gentle heat. On cooling crystals in yellow needles are obtained. These are slightly soluble in cold water, still less in alcohol, melt at 115° and volatilize without alteration at a higher temperature. When kept in a moist state in a closed vessel, ammonium salicylite gradually decomposes, blackens, becomes semi-fluid, gives off ammonia, and acquires a very penetrating odor of roses. Calcium salicylite, after being kept for a time and then dissolved with water, is said to give the same result; and an aqueous distillate faintly approaching it results when treating methyl salicylate (oil of Gaultheria procumbens) with caustic potash. Other compounds named are methyl benzylenic ether, phenyl paratoluate, phenyl benzoate and methyl benzoate.

For references to this most interesting subject consult Sawer's "Odorographia," London, 1892; Sawer's "Rhodologia," a discourse on roses and the odor of rose, Brighton (England). For information concerning "geraniol," "rhodinol" and kindred compounds, see Schimmel & Co.'s Semi-annual Reports for 1896 and 1897. The various pharmaceutical and allied journals for several years back may also be profitably consulted.

Marks of Strength On Containers of Ammonia Water.

(C. H. B.) The arbitrary designations "F," "FF," "FFF," etc., used by some manufacturers, have no uniform significance. Usually, however, "F" means "ordinary official," or 10 per cent. ammonia water; "FF" refers to a solution containing about 14 per cent. of NH_3 and having the specific gravity 0.945, corresponding to 18° Baumé; "FFF" refers to a solution containing about 17.5 per cent. of NH_3 and having the sp. gr. 0.933, corresponding to about 20° Baumé. This method of indicating the strength of solutions of ammonia, sweet spirits of nitre, etc., is deservedly very nearly obsolete.

The statement "20 deg. Be.," which you quote, means that the solution upon which it is placed has a density corresponding to 20° when measured by the scale of Baumé's hydrometer. As you are probably aware, Baumé has two instruments; one for liquids heavier than water, and one for liquids lighter than water. Almost any work on practical pharmacy will give you information concerning the application of these instruments. The principal difficulty in regard to Baumé's hydrometers is that they are marked by arbitrary numbers which have no necessary connection with the sp. gr., and they can only be used with facility when access can be had to the tables published in works of reference in which the degrees Baumé, with their corresponding specific gravity numbers are represented. The strength of official ammonia water is correctly expressed by the Pharmacopœia in the statement that it contains 10 per cent. by weight of the gas (NH_3).

Zinc Chloride, Butter of Antimony and Venice Turpentine.

(H. L. S.) received the following:

Chloride of zinc	1 ounce
Butter of antimony	1 ounce
Balsam of fir	2 ounces
Vaseline	4 ounces

He says he powdered the zinc chloride and mixed it with ½ ounce butter of antimony, when he detected the odor of free chlorine. He then added 1 ounce Venice turpentine (?) which produced an evolution of heat. The mass became "sticky" and then so hard he could only with difficulty incorporate the vaseline. What are the reactions and how shall he proceed. We think our correspondent is somewhat mixed in his report of his manipulations, for he says he used Venice turpentine which is not mentioned in the formula he submits; neither does he refer to the incorporation of the balsam of fir. He seems also to have used but ½ ounce butter of antimony, though he does not give the reasons for this procedure. However, the odor of free chlorine may have been due to the presence of that substance in the butter of antimony (liquid butter of antimony (?)) or chlorine may have been liberated when the two salts were mixed, the latter reaction depending upon the character, purity, acidity, etc., of the respective chlorides. As is well known zinc chloride tends to form basic insoluble compounds, the so-called oxychlorides (cements), and this is probably what took place in our correspondent's manipulations. Upon the other hand butter of antimony tends to form soluble crystalline double salts with a variety of metallic chlorides. The heat evolved was doubtless due to the oxidation of the oil of turpentine (most of the Venice turpentine used in this country is said to be resin dissolved in oil of turpentine) by the chlorine. This prescription is evidently intended as a caustic application, possibly one of the so-called "cancer cures." To dispense it divide the vaseline into two portions incorporating with each separately the respective salts. Rub the two mixtures well together and add the balsam of fir. In this procedure we have taken no cognizance of the Venice turpentine noted because it is not mentioned in the formula.

Emulsifiers.

(J. H. P.) We cannot give the formula for the proprietary preparation. An emulsifying agent used in proportionately small quantities is saponin. The following are examples by Schazki of the proportions of various materials required to make satisfactory emulsions:

(1)	Castor oil	2	ounces
	Saponin	4¾	grains
	Distilled water	10	ounces
(2)	Cod liver oil	3	ounces
	Saponin	3	grains
	Oil peppermint	2	drops
	Distilled water	3	ounces
(3)	Copaiba	2½	ounces
	Saponin	3½	grains
	Distilled water up to	6	ounces
(4)	Creosote	20	minims
	Oil almonds	2½	drams
	Saponin	1	grain
	Water up to	3	ounces

The saponin should be dissolved in as little water as possible, and triturated in a mortar with the oleaceous body, and the rest of the water added gradually. According to the authority cited, pure saponin is not poisonous, and in the above mentioned quantities is therapeutically inert.

A saccharated casein powder has also been recommended a substitute for the various gums employed as emulsifiers, the advantages claimed being that such emulsions are more perfect, more permanent and better borne by the stomach. According to Blankinship, a good powder of this character may be obtained by the following process: Add ammonia in the proportion of ½ fluid ounce to 1 quart of fresh milk, shake the mixture well and set aside for 24 hours, when the mixture will have separated into two layers, the upper being the semi-saponified fatty constituents, the lower constituting the lacto serum. The latter, after separation, is treated with acetic acid until all the casein has been precipitated. Remove from the magma as much of the moisture as possible by pressure, add 10 grains of sodium bicarbonate, and then incorporate, by means of trituration, enough sugar so that, after drying, it shall represent 10 per cent. of the entire mass. Preserve in well-stoppered bottles. The powder will keep for several years.—(Proceedings A. Ph. A., 1895.)

Manufacture of Matches.

(W. A. H.) Each factory uses its own methods and chemical mixtures, though, in a general way, the latter do not vary greatly. It is impossible here to give a full account of the different steps of manufacture, and of all the precautions necessary to turn out good marketable matches. However, in the manufacture of the ordinary safety match, the wood is first comminuted and reduced to the final shape and then steeped in a solution of ammonium phosphate (2 per cent. of this salt with 1 or 1½ per cent. of phosphoric acid), or in a solution of ammonium sulphate (2½ per cent.), then drained and dried. The object of this application is to prevent the match from continuing to glow after the match has been burned out. Next the matches are dipped into a paraffin, or stearin bath, and after that into the match-bath proper, which is best done by machines constructed for the purpose. Here are two formulas for the "composition:"

(1)	Potassium chlorate	2,000	parts
	Lead binoxide	1,150	parts
	Red lead	2,500	parts
	Antimony trisulphide	1,250	parts
	Gum arabic	670	parts
	Paraffin	250	parts
	Potassium bichromate	1,318	parts
(2)	Potassium chlorate	2,000	parts
	Lead binoxide	2,150	parts
	Red lead	2,500	parts
	Antimony trisulphide	1,250	parts
	Gum arabic	670	parts
	Paraffin	250	parts

Rub the paraffin and antimony trisulphide together, and then add the other ingredients. Enough water is added to bring the mass to a proper consistency when heated. Conduct heating operations on a water batth. The sticks are first dipped in a solution of paraffin in benzine and then are dried. For striking surfaces, mix 9 parts red phosphorus, 7 parts pulverized iron pyrites, 3 parts pulverized glass, and 1 part gum arabic or glue, with water, q. s. To make the matches water or damp proof, employ glue instead of gum arabic in the above formulas and conduct the operations in a darkened room.

For parlor matches dry the splints and immerse the ends in melted stearine. Then dip in the following mixture and dry:

Red phosphorus	3	parts
Gum arabic or tragacanth	0.5	parts
Water	3	parts
Sand (finely ground)	2	parts
Lead binoxide	2	parts

Perfume by dipping in a solution of benzoic acid.

Formulas for ordinary matches, matches without sulphur, etc., may be found in this journal, Nov. 19, 1896, page 668.

Chewing Gum.

(W. Co.) The manufacture of chewing gum is by no means the simple operation that it seems upon examination of the formula. Considerable experience in manipulation is necessary to success and the published formulas can at best serve as a guide rather than as something to be absolutely and blindly followed. Thus, if the mass is either too hard or soft, change the proportions until it is right; often you will find that different purchases of the same article will vary in their characteristics when worked up. Some manufacturers add a little paraffin or wax, to harden the mass, but the most successful attribute their success to the employment of the most approved machinery and greatest attention to details. The working formulas and the processes of these manufacturers are guarded as trade secrets, and aside from publishing the following general formulas, we can give little information:

Tolu Chewing Gum.

Chicle	3½	pounds
Paraffin wax	1	pound
Tolu balsam	2	ounces
Peru balsam	1	ounce

Dissolve the gum in as much water as it will take up, melt the paraffin, and mix all together. Now take

Sugar, finely granulated	10	pounds
Glucose	4	pounds
Water	3	pints

Put the sugar and glucose into the water, dissolve and boil them up to "crack" degree (confectioners' term), pour the syrup over the oil slab, and turn into it sufficient of the above gum mixture to make it tough and plastic, adding any one of the following flavors, if desired: Cinnamon, chocolate, sandal wood, myrrh, galangal, ginger or cardamom.

A somewhat different and more simple formula, taken from the New Idea, is as follows:

Tolu balsam	4	ounces
Benzoin	1	ounce
White wax	1	ounce
Paraffin	1	ounce
Sugar, powdered	1	ounce

Melt together, mix well, and roll into sticks.

Spruce Chewing Gum.

Spruce gum	20	parts
Chicle	20	parts
Sugar, powdered	60	parts

Melt the gums separately, mix while hot, and immediately add the sugar, a small portion at a time, kneading it thoroughly on a hot slab. When completely incorporated, remove to a cold slab, previously dusted with powdered sugar, roll out at once into sheets and cut into sticks. Any desired flavor or color may be added to or incorporated with the sugar.

For some general information regarding the manufacture of chewing gum, see this journal, Oct. 15, 1896, page 497.

THE PHARMACEUTICAL ERA

[*WEEKLY.*]

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IMPORTANT NOTICE.

The Subscription Price of the Era to be Advanced.

With the next edition the Era completes its tenth year, and thereafter the subscription price for the United States, Canada and Mexico will be $3.00 per annum, and to foreign countries in the Postal Union $4.00 per year.

In explanation of this action, we wish to state that we are working upon the principle that what the drug trade wants is better journals—not more of them. Our two years of experience with the Weekly has convinced us that the prompt weekly service offer many advantages of material benefit to our subscribers, the trade generally, but such a journal cannot be produced and sold at the low price of $2.00 per annum. There is no good reason why the retail druggist should be compelled to wait from two to four weeks for his journal, when dealers in all other lines are served with their weeklies.

We are very ambitious for the Era, and we shall continue to improve its service until we have demonstrated how valuable a journal we are able to produce. The coming year will be no exception to its record for constant progress, as we have in contemplation a number of improvements which will make the journal more valuable to its readers.

We are particularly anxious to keep faith with our old friends, and for this reason our present subscribers will be permitted to renew their subscriptions for 1897 at the old rate. We shall also give all druggists one more chance to secure the paper for 1897 at $2.00, if their orders reach us before Feb. 1, 1897. After that date the new price will be strictly maintained.

We wish to improve this opportunity to thank our many friends for past favors, and to express the hope that the Era may continue to merit their patronage and good wishes. D. O. HAYNES & CO.

Tax Free Alcohol for Druggists.

At a special meeting of the Congressional Committee held in New York to consider evidence for and against the tax free alcohol proposition, the statement was made that 30,000 retail druggists were opposed to free alcohol. The reason given seemed to be a sort of "dog-in-the-manger" one, that their opposition was because they believed that no one would profit from free alcohol, except the large patent medicine manufacturers. We have frequently asserted, and our assertions are backed up with good proof, that retail druggists do want free alcohol for use in their business. The only question is, can such free alcohol be obtained without accompanying restrictions and regulations which will be so burdensome as to make the gift of no value to the druggists. We believe it can. There seems to be quite prevalent an idea that free alcohol is possible only when it is used under the supervision of a regular government employé, in a bonded warehouse, or something of the sort. The proposition which has been considered for some two or three years past contemplates nothing of this character, but allows any one to purchase alcohol, paying the full internal revenue tax thereon, and if after it has been manufactured into the desired articles the user can show that this has been done legitimately, the government is then to refund the amonnt of tax paid. Nothing at all in this of revenue inspectors. There seems to have been a determination in some quarters to misrepresent this point, or to cover it up entirely.

But recently druggists have been doing some thinking for themselves, and so far from there being a unanimity of opinion in opposition to free alcohol, as was stated before the committee, there is a decided expression of opinion in favor of it. Several State associations have officially declared their support of the free alcohol proposition—the New York State Association only a couple of weeks ago, and the Massachusetts Association but last week.

Druggists have been crying for free alcohol for many years. They need it, and should have it, and we believe they can have it, and under regulations which will be satisfactory, if they will only so express their desire. Free alcohol may benefit patent medicine manufacturers, but it will likewise be of service to the retail druggist who uses alcohol in many preparations and for many uses. The large manufacturers of pharmaceuticals (not of secret composition) will have to work under the same conditions of competition which now affect them, and retail druggists will be enabled to purchase their supplies of these goods at the same proportionate advance over cost as now, for this competition will inevitably and quickly bring the manufacturers' selling prices down satisfactorily near to the cost of production.

We believe druggists are blind to their own interests if they do not carefully consider this free alcohol question. Turn it over carefully in your minds, form a cool and unbiased judgment concerning it, and then express your views. If, after such consideration, you desire tax free alcohol for use in your business, say so. If you do not desire it, say so, but do not allow the matter to go by default.

The Congressional Committee is expected to prepare and present early in the spring to Congress a bill embodying their views and the desires of the various industries interested. If the majority of these industries want free alcohol, the bill will be framed in accordance with this desire. If the majority do not desire it, no attempt will probably be be made to enforce such a provision. It is every druggist's duty to express his opinion and cast his vote in this matter.

The Drug Clerk.

Some of the metropolitan papers have recently been giving a little editorial attention to the drug clerk. On the whole, there is little to object to in their utterances upon this subject. They find the drug clerk a hard-worked and poorly paid individual, and they are to be supported in their urging that some measure be instituted whereby the hours of labor in the drug store may be lessened in number, and the clerks receive remuneration more justly commensurate with the value of their services and the responsibility of their office.

It is gratifying that these papers seem at least to have had their eyes opened, for they now state emphatically that the drug store is no longer the certain road to wealth that it was when paragraphers bunched the druggist with the plumber and the iceman as a practitioner of extortion. The newspapers can do a good work if they will educate the public a little, to the effect that druggists are not extortionists; in fact, their business affords merely a bare living, and that the profits from the prescription branch, where special knowledge and skill are attained only through great expenditure of time, labor and money, are much lower in proportion than the professional remuneration of lawyers and doctors, with which, however, it should stand upon the same plane of equality.

But while correcting this error to some extent, these papers are apt to fall into another in the other direction. For instance, one states that with the lessening of the profits of the calling there has come a distinct deterioration in the character of the assistants hired to put up prescriptions, and that "Benjamin Harrison's theory that a cheap coat makes a cheap man' may not be wholly tenable, but a cheap drug clerk is apt to have a hand in preparing a shroud." Such a statement as this is one of opinion only, and there are no facts to back it up. On the contrary, the drug clerks of to-day are better educated and better qualified than ever before. Our colleges of pharmacy are raising their standards, giving better instruction, turning out better and more competent men.

To be sure, the drug trade has fallen upon evil days, but let us hope that some of the serious evils of which it complains may be ultimately, if not quickly, removed, and among these include the very serious ones of poor pay and long hours of service for the drug clerk.

"Come In!"

There are various ways of saying this. In some regions, where old clothes are sold physical force of varying degree is used, but in the more refined sections this task of inviting people into a store is intrusted to the show window. Like other talking machines its effectiveness depends upon what is put in it. And if not closely watched and given daily attention it may tell people to keep away or may assume the police function of inviting them to move on.

Unquestionably the designer of a show window desires most of all that it convey this "come in" idea, and with reference to time, he would like to have it suggest coming in right away. Not all show windows upon which much care is expended present this incentive for immediate action. They are elaborate, artistic and sometimes allegorical, but are filled with extraneous articles or present ideas which will remind people of that particular store only when they are thinking of that kind of stores. These displays are somewhat like the candy mottoes of the confectioner or verses in an autograph album that modestly say "Remember me." There is not necessarily deep disparagement of this method in window display in saying that the kind that brings people in right away is better. One will stimulate future business and the other is for the present. One may excite comment and praise and linger profitably in the minds of beholders, but the other is to bring in the dollars of to-day to pay bills that are crying for payment. The latter kind of window display is in most cases the preferred, and it can be made by displaying seasonable goods that people want at certain times, or by showing novelties that will be wanted when they are seen.

The druggist may not be able to prophesy what a day may bring forth, but by keeping his weather eye open he may anticipate what people will need upon cold, blustery days, and arrange cold cures, hot water bottles, chest protectors, etc., in his windows at times when people will feel like coming in immediately when they see them.

Unregistered Pharmacists.

There seems to be a little spurt of activity among our Boards of Pharmacy with regard to enforcing the law against the practice of pharmacy by unregistered men. The New York State Board is making it a little lively for a number of these individuals, and latest returns are to the effect that the Pennsylvania Board is actively following it. The Wisconsin Board has always been gratifyingly successful in its prosecutions, and hardly a month goes by without news of some case of this sort. Without doubt, there are unregistered men practicing pharmacy in all of our States, more in some than in others.

The boards in some States are more active than those in others, and there is often displayed a too great readiness to jump to the conclusion that the inactive boards are thus through laziness or disinclination. This is hardly a warrantable conclusion to draw. When a board has funds sufficient to undertake and carry through prosecutions, it is that board's duty to thus vigorously enforce the law, and if it fails to do so criticism is merited, and should be sharp. But in many of the States the Boards of Pharmacy are in a serious financial condition. The funds originally at their disposal, by reason of the fees collected for registration, have dwindled to almost nothing, because of the absence of the re-registration feature in the law. Such boards have no weapons with which to fight, and it is generally found that the prosecuting attorneys will not undertake cases against unregistered pharmacists upon their own responsibility as State officers. This is a very serious condition which the boards have had to meet and, in very many cases, have been unable to overcome.

There are many opinions pro and con concerning the value and effectiveness of pharmacy laws. This is not the place to argue the question. So long as such laws do exist, however, the authorities charged with their execution have nothing to do but to enforce them. It is to be hoped that the activity against unregistered men who are illegally conducting drug stores will be continued unceasingly, and with the result of weeding out a class of men against whom the laws were directly framed.

A Virtue of a Necessity.

There are incidents in the life of the druggist, as portrayed by the newspapers, which undoubtedly contribute to the gayety of nations. It is a matter for mirth when this reputedly wealthy person sells postage stamps at cost and obligingly dampens them for his patrons, or knocks off work in the middle of an arsenic-strychnine prescription to help a customer (?) find a name in the directory. All this and more has become so much a matter of humor that the public regards it with that solemnity and respect which attach to mother-in-law and stovepipe jokes. It is apparently too late to stem this facetious tide, and most druggists have given it up. The only opportunity offered for remonstrance against this menial, non-remunerative business is that afforded by those occasional gatherings of the fraternity in which woes are discussed and remedies for them dismissed as being unattainable. Drug journals and sympathizing brethren may pour oil upon these wounds, but the dear public returns to the attack with salt and vinegar.

If the combined wisdom of editors and suffering pharmacists fails to suggest an escape from doing so many little errands for the public free of charge, why not make a virtue of necessity Why not drop the rôle of "knight of the sorrowful countenance," and surfeit the grasping public with accommodations and pleasing alacrity. Occasional attacks of illness, touches of colic, etc., have made the drug store a sort of necessity for some people, but why not make it a sine qua non, as it were; make it so necessary for people, by doing little things for them that they will be unable to functionate properly without it, and will consider its closure or financial embarrassment as a personal calamity to themselves."

Such suggestion may cause a popping of corks from the vials of wrath kept in many well-regulated pharmacies, but we have anticipated a sturdy lefense. We know of a druggist who has pursued this accommodating policy. He began business a few years ago with one store, and now has three. He has given the public about all it could ask for or think of in the way of conveniences—telephone messengers, express money orders, postage stamps, directories, railroad time-tables, etc., etc. Instead of making these things known only when people inquired for them, he has advertised them, with the result that his stores have become very nearly public necessities in their respective localities. He serves the public, but he lets the public know it. He has made a virtue of necessity. He has also made money.

Our esteemed contemporary, Meyer Bros.' Druggist, presents the very interesting (and valuable, if true) information, that litmus pencils have been introduced, one end of which will detect alkaloids and the other essences. If the words "alkalies" and "acids" had been used in this paragraph, we would believe it, for we know it to be a fact that such pencils have been introduced. A little napping of the Argus-eyed editor permitted this erroneous statement to go through.

VOLUMETRIC ESTIMATION OF ARSENIC.—The alkaline solution of arsenic is evaporated to as low a bulk as possible, from 20 to 40 cc. of this solution are then diluted with three times its bulk of hydrochloric acid (1.17 sp. gr.), followed by an excess of hypophosphorous acid, whereby metallic arsenic is precipitated in form of a brown powder. After standing for 12 hours, the mixture is warmed on a water bath, adding an equal volume of boiling water; the precipitate is then collected on a filter and washed with boiling water till the wash water is free from acid reaction. The filter with contents are returned to the original vessel, adding $\frac{N}{10}$ volumetric solution of iodine until the fluid becomes a pale yellow color, showing that the metallic arsenic is converted into arsenous acid with some arsenic acid. In order to complete the oxidation of all of the arsenic to arsenic acid 50 cc. of water and 10 cc. of a concentrated solution of sodium bicarbonate are added and after the decolorization is complete, a few drops of starch paste are added followed by a $\frac{N}{10}$ solution of iodine, until a pale blue color results. Each cc. of the iodine solution is equivalent to 0.0015 gm. of arsenic. The reaction is as follows:

$$H_3AsO_3 + 2I + 2NaHCO_3 = H_3AsO_4 + 2NaI + 2CO_2 + H_2O.$$

The ammonium salts have been recommended in place of the sodium.

William Jay Schieffelin.

No name is better known in drug circles than that of Schieffelin. The wholesale drug house of Schieffelin & Co. is the oldest in America. One of the youngest members of this firm is William Jay Schieffelin, who succeeded his father, the late W. H. Schieffelin. He is tall, handsome and clean-cut. He was born in New York city thirty years ago, graduated from Columbia College School of Mines in 1887, and two years afterward took the degree of Doctor of Philosophy at the University of Munich, Germany, where he made a special study of chemistry. Naturally his favorite department of work is the laboratory of Schieffelin & Co., where he is to be found most of every day.

Mr. Schieffelin is active in enterprises looking to the advancement of pharmacy. He is a trustee of the New York College of Pharmacy, the secretary of the Drug Trade Section of the New York Board of Trade and Transportation, a member of the Chemical Societies of America, London and Germany, and of the New York Committee of the Society of Chemical Industry.

In politics Mr. Schieffelin represents the cause of municipal reform. He was one of the founders of the City Club of New York, which has for its motive the purification of city politics. The famous Committee of Seventy, which conducted the reform campaign in New York City in 1894, was a result of the activities of this club. Mr. Schieffelin was a member of the Committee of Seventy.

Mr. Schieffelin is particularly fortunate and happy in his domestic relations. He was married in 1891 to a daughter of the late Col. Elliott F. Shepard, who is also a granddaughter of the late William H. Vanderbilt. They have three lovely children, and it would be difficult to find a prouder or more devoted father. He is a vestryman in St. George's Church, and a liberal contributor to many charitable objects, particularly at this season of the year.

PARAPLASTE.—A plaster mass, consisting of a mixture of caoutchouc, wool fat, rosin and dammar rosin, to which from 40 to 65 per cent. of medicament is added. It is spread upon a fine dense cotton fabric.

TITANIUM has been found as titanic acid in the ash of the oak (0.3 per cent.) and apple tree (0.11 per cent.); also a bituminous coal of Tennessee (0.7 per cent.) and anthracite from Pennsylvania (2.6 per cent.).

Correspondence.

We are pleased to publish here communications from our readers on topics of interest to the drug trade. Writers are requested to express their views as briefly as possible. Each article must be signed by its writer, but his name will not be published if so requested.

MR. KLINE'S REPLY.

He Authorizes the Era to Offer $500 for Proof of Any Violation of Contract by Smith, Kline & French CO.

Philadelphia, Dec. 21, 1896.

To the Editor:

I notice in your issue of the 17th inst., you have devoted quite a considerable amount of space to the somewhat extensive correspondence between C. H. McConnell, president and manager of the notorious cutting establishment known as the "Economical Drug Company," in Chicago, and myself.

The motive instigating this correspondence, and giving it uncompleted to the public without my knowledge or consent, is so manifest throughout that a simple reference to it is sufficient, as those of your readers who have been willing to take the trouble to peruse it have doubtless already arrived at a proper conclusion.

Of course, the insinuation in his final letter of Dec. 11, written, as I can now understand, expressly for publication, were of such a character that I could not stoop to take any notice of them, and, as a matter of fact, did not intend to make any reply. As he has seen fit, however, to have my letters published, together with his interpretations, suiting his own purposes, in his letter of Dec. 11, it is due to our concern and to myself that I refer to one or two statements made in my own letters, and to several misstatements in his.

In my letter of Nov. 27, I stated that "for years I and the concern with which I am connected have fully recognized that it is utterly futile to attempt to keep the cutters out of goods, and that our efforts in this direction simply aided our neighbors, who felt no obligation to occupy this position; consequently, it has been a well-known fact that any one with whose credit we were satisfied could buy goods of us, but only in accordance with the terms under which they were sold."

The words "any one" in this quotation should have been modified as follows:

"Any one doing business in a large city where our refusal to fill orders could not possibly aid the competitors of such a cutter."

It should be stated that for years, as is well known to those familiar with our business, we positively refused to sell any goods whatever, or have any account with aggressive advertising cutters. In doing so, while we lost a very large amount of business which, in some cases at least, went to those who had always sympathized with the cutters, we did not find that we were actually helping our friends, the retailers, one iota. We, however, still keep up this rule, and now refuse to have any dealings with those cutters doing business in the cities and towns in territory where there is any chance that the legitimate retail druggists can maintain their ground in ridding themselves of unfair and unreasonable competition, and we also refuse all orders from department stores. Our position in this regard with the trade of the city of Philadelphia, for example, is well understood, and to quote from my letter of Nov. 27, "there is nothing we do here which there is any reason for our attempting to hide."

I now quote the following two extracts from Mr. McConnell's letter of Dec. 11, viz.:

"I have no desire to impugn your honesty, which you ask me to give you credit for, and yet it has been told me by prominent cutters that they buy from your firm on terms that are entirely satisfactory to them, without any reference whatever to the rebate plan."

Further: "It is also a somewhat curious condition of affairs that cutters, who previously had patronized the 'arch-cutters' Park and obtained from him a straight discount of 5 per cent., irrespective of rebate quantity of goods, and who were situated nearer Cincinnati than Philadelphia, with freight rates in favor of the former city, should leave Park and buy from the firm of Smith, Kline & French. I do not choose to make any comment on such a condition of affairs (which I am assured exits, but do not know it of my own knowledge) other than to say that if true, it has a curious look, to say the least."

The object in making these insinuations, as already stated, is so manifest that it needs no comment. Mr. McConnell was perfectly well aware, when he wrote this letter, that he was stating a malicious and willful falsehood, as no one can truthfully assert that we ever departed from the letter and spirit of our rebate contracts, or that we give a gross price on purchases of a lesser quantity, or a lump price on assorted orders, made up of several items, to indirectly cheapen the rebated items on such orders, or that we give a lower price on items not restricted to obtain orders for others which are. Whatever mistakes or errors in judgment have been made, I can challenge any one to present evidence that our house is not absolutely innocent of such transactions, and that it does not maintain the letter and spirit of its obligations in this or any other regard.

It is a well-known fact, however, that a lie can be more readily started than stopped, and it is also a well-known fact that men built mentally and morally as is Mr. McConnell will not accept such a denial when their purposes are better served otherwise; therefore, I beg hereby to authorize you to offer in your columns a reward of $500.00 for any proof that shows any case where we have sold or offered any goods in violation of the terms made by the manufacturers of the goods under contract with us.

In conclusion, I would ask if it does not seem strange that if I or the concern with which I am connected have been so friendly and helpful to the class of cutters of which Mr. McConnell may safely be called the representative, that I should be subjected to the malignant attacks which characterize this correspondence? Yours very truly, M. N. KLINE.

SIR JOSEPH LISTER ON ANTITOXINS.

In the presidential address of Sir Joseph Lister before the British Association for the Advancement of Science, at the recent meeting in Liverpool, he set forth very clearly the present status of diphtheria anti-toxin in the following words:

"It was shown several years ago by Roux and Yersin, working in the Institut Pasteur, that the crust, or false membrane, which forms upon the throats of patients affected with diphtheria, contains bacteria which can be cultivated outside the body in a nutrient liquid, with the result that it acquires poisonous qualities of astonishing intensity, comparable to that of the secretion of the poison glands of the most venomous serpents; and they also ascertained that the liquid retained this property after the microbes had been removed from it by filtration, which proved that the poison must be a chemical substance in solution, as distinguished from the living element which had produced it. These poisonous products of bacteria, or toxins, as they have been termed, explain the deadly effects of some microbes which it would otherwise be impossible to understand. Thus, in diphtheria itself, the special bacillus, which was shown by Löffler to be its cause, does not become propagated in the blood like the microbe of chicken cholera, but remains confined to the surface on which it first appeared; but the toxin which it secretes is absorbed from that surface into the blood, and so poisons the system. Similar observations have been made with regard to the microbes of some other diseases, as, for example, the bacillus of tetanus, or lockjaw. This remains localized in the wound, but forms a special toxin of extreme potency, which becomes absorbed and diffused through the body. Wonderful as it seems, each poisonous microbe appears to form its own peculiar toxin. Koch's tuberculin was of this nature, a product of the growth of the tubercle bacillus in culture media. Here again, great effects were produced by extremely minute quantities of the substance, but here a new peculiarity showed itself, viz., that patients affected with tubercular disease, in any of its varied forms, exhibited inflammation in the affected part, and general fever after receiving under the skin an amount of the material, which had no effect whatever upon healthy persons. I witnessed in Berlin some instances of these effects, which were simply astounding. Patients affected with a peculiar form of obstinate ulcer of the face showed after a single injection of the tuberculin violent inflammatory redness and swelling of the sore and surrounding skin; and, what was equally surprising, when this disturbance subsidede the disease was found to have undergone great improvement. By repetition of such procedures, ulcers, which had been steadily advancing in spite of ordinary treatment, became greatly reduced in size and, in some instances, apparently cured. Such results led Koch to believe that he had obtained an effectual means of dealing with tubercular disease in all its forms. Unhappily, the apparent cure proved to be only of transient duration, and the high hopes which had been inspired by Koch's great reputation were dashed. It is but fair to say that he was strongly urged to publish before he was himself disposed to do so, and we cannot but regret that he yielded to the pressure put upon him.

But though Koch's sanguine anticipations were not realized, ti would be a great mistake to suppose that his labors with tuberculin have been fruitless. Cattle are liable to tubercle, and, when affected by it, may become a very serious source of infection for human beings, more especially when the disease affects the udders of cows and so contaminates the milk. By virtue of the close affinity that prevails between the lower animals and ourselves, in disease as well as in health, tuberculin produces fever in tubercular cows, in doses which do not affect healthy beasts. Thus, by a subcutaneous use of a little of the fluid, tubercle latent in internal organs of an apparently healthy cow can be with certainty revealed, and the slaughter of the animal after this discovery protects man from infection.

It has been ascertained that glanders presents a precise analogy with tubercle as regards the effects of its toxic products. If the microbe which has been found to be the cause of this disease is cultivated in appropriate media, it produces a poison which has received the name of mallein; and the subcutaneous injection of a suitable dose of this fluid into a glandered horse causes striking febrile symptoms, which do not occur in a healthy animal. Glanders, like tubercle, may exist in insidious, latent forms, which there was formerly no means of detecting, but which are at once disclosed by this means. If a glandered horse has been accidentally introduced into a large stable this method of diagnosis surely tells whether it has infected others. All receive a little mallein. Those which become affected with fever are slaughtered, and thus not only is the disease prevented from spreading to other horses, but the grooms are protected from a mortal disorder.

This valuable resource sprang from Koch's work on tuberculin, which has also indirectly done good in other ways. His distinguished pupil, Behring, has expressly attributed to those researches the inspiration of the work which led him, and since his famous collaborateur, the Japanese, Kitasato, to their surprising discovery of antitoxic serum. They found that if an animal of a species liable to diphtheria or tetanus received a quantity of the respective toxin so small as to be harmless and afterward, at suitable intervals, successively stronger and stronger doses, the creature, in course of time, acquired such a tolerance for the poison as to be able to receive with impunity a quantity very much greater than would at the outset have proved fatal. So far, we have nothing more than seems to correspond with the effects of the increasingly potent cords in Pasteur's treatment of rabies. But what was entirely new in their results was that, if blood was drawn from an animal which had acquired this high degree of artificial immunity, and some of the clear fluid, or serum, which exuded from it after it had clotted was introduced under the skin of another animal, this second animal acquired a strong, though more transient, immunity against the particular toxin concerned. The serum in some way counteracted the toxin, or was anti-toxic. But more than that, if some of the anti-toxic serum was applied to an animal after it had already received a poisonous dose of the toxin, it preserved the life of the creature, provided that too long a time had not elapsed after the poison was introduced. In other words, the antitoxin proved to be not only preventive, but curative.

Similar results were afterward obtained by Ehrlich, of Berlin, with some poisons not of bacterial origin, but derived from the vegetable kingdom, and quite recently the independent labors of Calmette, of Lille and Fraser, of Edinburgh, have shown that antidotes of wonderful efficacy against the venom of serpents may be procured on the same principle. Calmette has obtained antitoxin so powerful that a quantity of it, only 1-200,000 part of the weight of an animal, will protect it perfectly against a dose of the secretion of the poison glands of the most venomous serpents known to exist, which, without such protection, would have proved fatal in four hours. For curative purposes lager quantities of the remedy are required, but cases have been already published by Calmette in which death appears to have been averted in the human subject by this treatment.

Behring's darling object was to discover means of curing tetanus and diphtheria in man. In tetanus the conditions are not favorable, because the specific bacilli lurk in the depths of the wound, and only declare their presence by symptoms caused by their toxin having been already in greater or less amount diffused through the system, and in every case of this disease there must be a fear that the antidote may be aplied too late to be useful. But in diphtheria the bacilli very early manifest their presence by the false membrane which they cause upon the throat, so that the antitoxin has a fair chance, and here we are justified in saying that Behring's object has been attained.

The problem, however, was by no means so simple as in the case of some mere chemical poison. However effectual the antitoxin might be against the toxin, if it left the bacilli intact, not only would repeated injections be required to maintain the transient immunity to the poison perpetually secreted by the microbes, but the bacilli might by their growth and extension cause obstruction of the respiratory passages.

Roux, however, whose name must always be mentioned with honor in relation to this subject, effectually disposed of this difficulty. He showed by experiments on animals that a diphtheritic false membrane, rapidly extending and accompanied by surrounding inflammation, was brought to a stand by the use of the anti-toxin, and soon dropped off, leaving a healthy surface. Whatever be the explanation, the fact was thus established that the anti-toxic serum, while it renders the toxin harmless, causes the microbe to languish and disappear.

No theoretical objection could now be urged against the treatment, and it has during the last two years been extensively used in practice in various parts of the world, and it has gradually made its way more and more into the confidence of the profession. One important piece of evidence in its favor in this country (England) is derived from the report of the six large hospitals under the management of the London Asylum Board. The medical officers of these hospitals at first naturally regarded the practice with skepticism, but as it appeared to be at least harmless they gave it a trial, and during the year 1895 it was very generally employed upon the 2,182 cases admitted, and they have all become convinced of its great value. In the nature of things, if the theory of the treatment is correct, the best results must be obtained when the patients are admitted at an early stage of the attack, before there has been time for much poisoning of the system, and, accordingly, we learn from the report that, comparing 1895 with 1894, during which latter year the ordinary treatment had been used, the percentage of mortality—in all the six hospitals combined—among the patients admitted on the first day of the disease, which in 1894 was 22.5, was only 4.6 in 1895; while for those admitted on the second day the numbers are 27 for 1894 and 14.8 for 1895. Thus, for cases admitted on the first day, the mortality was only one-fifth of what it was in the previous year, and for those entering on the second it was halved. Unfortunately, in the low parts of London, which furnish most of these patients, the parents too often delay sending in the children till much later, so that on the average no less than 67.5 per cent were admitted on the fourth day of the disease, or later. Hence, the aggregate statistics of all cases are not nearly so striking. Nevertheless, taking it altogether, the mortality in 1895 was less than had ever before been experienced in those hospitals. I should add that there was no reason to think that the disease was of a milder type than usual in 1895, and no change whatever was made in the treatment, except as regards the antitoxic injections.

There is one piece of evidence recorded in the report, which, though it is not concerned with high numbers, is well worthy of notice. It relates to a special institution to which convalescents from scarlet fever are sent from all the six hospitals. Such patients occasionally contract diphtheria, and when they do so the added disease has generally proved extremely fatal. In the five years preceding the introduction of the treatment with antitoxin, the mortality from this cause had never been less than 50 per cent., and averaged on the whole 61.9 per cent. During 1895, under antitoxin, the deaths among the 119 patients of this class were only 7.5 per cent., or one-eighth of what had been previously experienced. This very striking result seems to be naturally explained by the fact that these patients being already in hospital when the diphtheria appeared, an unusually early opportunity was afforded for dealing with it.

There are certain cases of so malignant a character from the first that no treatment will probably ever be able to cope with them. But, taking all cases together it seems probable that Behring's hope that the mortality may be reduced to 5 per cent. will be fully realized when the public become alive to the paramount importance of having the treatment commenced at the outset of the disease.

DETECTION OF ANTIPYRINE.—The antipyrine is removed from its aqueous solution by shaking with chloroform, the residue after evaporating is then taken up with water, adding sodium nitrite and dilute sulphuric acid, the solution takes on a green color in consequence of the formation of nitroso-antipyrine. For quantitative estimation 0.02 gm. of antipyrine are dissolved in 25 cc. of water, followed by 1.6 cc. of sulphuric acid (1 per cent.) and 0.8 cc. of sodium nitrite solution (1 per cent.), diluting with water to 100 cc. The solution to be tested is diluted with measured volumes of water until both solutions are of the same intensity of color.

*SOME NOTES ON AMERICAN PHARMACY.**

By E. H. GANE, Ph. Chem.

In looking over the papers on this subject which have appeared in recent years in English drug journals, I am struck by the unanimity with which all the writers indulge in what is variously termed in the United States, "patriotic eagle screaming," "twisting the lion's tail," or, more appropriately, "pharisaical criticism." The possibility of English pharmacists having anything to learn from America is entirely ignored. One of the most recent of these papers, contributed to the Pharmaceutical Society by Mr. N. H. Martin, is so steeped in "insular prejudice" as to be almost valueless as a contribution to the subject. Pharmacy in the United States is in no more organized a condition than in England, but it must be considered from a different standpoint. The professional element as yet finds no place in American retail pharmacy, which is, moreover, much confused by the infusion of the customs of almost every European nationality, which have not yet even begun to assimilate harmoniously. Americans are now paying a large amount of attention to the decoration of the store, seeing that it is often utilized as a rendezvous or a general lounging place where the idler may pick up the news of the day, or the newspaper man secure "copy." The presence in almost every drug store of a telephone and directory, and the fact that many druggists act as assistant postmasters (unauthorized,) tend to preserve this feature and to detract from the true dignity of the pharmacist. The American store is popularly known, not by the quality of the drugs supplied, but by the quality of the products of the soda fountain. This latter is often a gorgeous structure resplendent in marble and onyx, and glittering with silver taps and fixings. Its cost will be anywhere from $100 to $3,000, and ofttimes it constitutes the only fitting of any value in the store. In others the fittings will be made to harmonize, and some stores are marvels of the decorator's art. In others, again, the gorgeousness is of a character belonging rather to the drinking saloon than to a semi-professional calling. In all the more important stores most attention is paid to the soda fountain, seeing that it is the article from which most of the druggists' profits come. A good pharmacist must be a good bartender, and the man who can best titillate the thirsty pallates of the American public is he who will secure the most trade. In addition, every drug store must keep a supply of cigars, candies, and fancy articles. In the products of the soda fountain the 'cuteness of the American is well displayed, and English pharmacists, particularly country ones, might with advantage study the question of supplying American temperance beverages in place of the extraordinary concoctions which one occasionally sees served by them.

In window dressing the American can give the Englishman points. A lavishness is often displayed which would startle an English druggist, for as yet the deadening and stultifying effect of the practice of pharmacy on the human being, as exemplified by the average English druggist, has only commenced to descend to his American confrére. A bicycle artistically made from tooth brushes, an excellent model of the Brooklyn Suspension Bridge made out of bottles of malt extract, and a full-grown cow, stuffed, to advertise a particular beef extract, are three of the designs seen in the course of a short walk. In advertising his store the American pharmacist is seen at his best. This is largely due to the efforts of two drug journals—the American Druggist and Pharmaceutical Record and the Pharmaceutical Era. Mr. Martin laid down the dictum that "pharmacy as a trade is a failure," but in America, at any rate, pharmacy as a trade is *not* a failure.

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*Read at a meeting of the Chemists' Assistants' Association (London), on November 19.

Apprenticeship is unknown in American pharmacy. The would-be pharmacist starts either as errand-boy or as clerk (assistant) at the soda fountain, where he learns what is considered the most important part of the retail drug business. He will commence on a salary of about three dollars a week, outdoors; indoor situations are few and far between. After he has mastered the intricacies of the soda fountain he may be promoted to counterman, where he will supply cigars, candies, patent medicines, and small amounts of drugs. The prescription department is usually a sealed book to him until after some years' service, so that of the better side of his pursuit he knows little or nothing. In the the country districts pharmacy may be described in the old expression "pars minima ipsa puella." Here the "side lines" of the druggist are so numerous and important that pharmacy is lost, and the youth will emerge ignorant of what pharmacy means. So small is the knowledge obtained by the clerk in his four years' preliminary training, and so valueless has it become, that many of the colleges are considering the advisability of abolishing the requirement of store experience prior to entrance, and of allowing men to study at college and graduate prior to entering a store. Out of forty-eight colleges, seventeen have already abolished the requirement, and more will probably shortly follow.

Preliminary experience over, the clerk will next endeavor to secure his license to practice. This he can do in several ways. In the cities he can go before the State Board of Pharmacy, which grants a license, after examination, to practice in that particular State only, or he may go to one of the various colleges and secure his degree of Ph. G., which virtually entitles him to practice in a majority of the States. The better class of pharmacists graduate from the colleges. The City and State Boards of Pharmacy in general are extremely lax in their requirements, but the various colleges are more severe, and in the best of these the student must spend three years, attending lectures and doing practical work in chemistry and pharmacy. Many of the colleges are excellently equipped, and they are officered in general by competent men, and the schedule is arranged so that the student need not necessarily give up store work during attendance at college. In general, the lectures are delivered in the afternoon. (True in but a few instances only.—Ed. Era.), leaving the student the morning, and, if necessary, the evening in which to earn his daily bread. The system of tuition is excellent, and distinctly superior to that followed in the English schools. There are, however, many so-called colleges whose system of education and graduation is nothing short of disgraceful. In Mr. Martin's paper the system described as prevalent in American institutions, is prevalent, as far as I can learn, only in the worst schools, and in the diploma mills of the West, the existence of which every American pharmacist deplores. Comparing the New York and Philadelphia colleges with the English School of Pharmacy, I have no hesitation in saying that the American comes first, both in equipment and system of tuition. In particular, there is no trace of the "cram," so prevalent in England. Not that I mean to say that the American institutions necessarily turn out better pharmacists, for that at present they do not; but with the system pursued therein they will, as soon as pharmacy enactments similar or superior to those in force in England are obtained, turn out not only better pharmacists but better educated men. At present, the weak point is the graduation requirement, and until the examining power is vested in a single body, laxity will prevail. American pharmacists recognize and deplore this; but the fact that an institution like the Philadelphia College of Pharmacy can yearly muster some six hundred students who are willing to spend years in study when they could secure the State license at a nominal expenditure of time and money speaks volumes for the future American pharmacist.

A clerk who has secured his diploma can command a salary of from $14 to $20 per week. The best city stores pay the best salaries; the absurd custom of the "classical" London houses in paying nominal salaries because of the "experience" gained by the assistant is not in accordance with American ideas, and would not for a moment be tolerated. Occasionally a clerk will get as much as $25 per week, but this is exceptional, $20 being considered a good salary for a retail druggist's clerk. The manager of one large pharmacy in New York is reputed to get $3,500 a year, and is probably the best paid employé in retail pharmacy in the world.

The social status of the pharmacist is higher than in England. He is practically on an equality with the medical practitioner. Frequently it is to the pharmacist that the physician looks for help in matters more strictly appertaining to pharmacy than to medicine. In the South and West, where the professional side of medicine is more or less at a discount, the physician does not deem it unprofessional to enter into an arrangement with the druggist whereby he secures a percentage on every prescription taken to his store. As the original prescription is always retained and filed by the druggists, this is a matter of easy arrangement. The druggist usually supplies his physician with prescription blanks, on which are the words "Take this to So-and-So's Pharmacy." The prescription will often bear, in addition, the words "No substitution allowed on any prescription;" not very complimentary to the druggist, it must be said. Substitution, indeed, is to the average American physician what prescribing by chemists is to the English medical man. The cry of substitution comes principally from the South and West, where the education and knowledge of the average physician leave much to be desired. Looking over the prescription books of a large firm recently, I found but six prescriptions out of about 500 which did not call for some proprietary remedy. Should the druggist venture to manufacture one of these from the formula given, instantly a howl goes up of substitution, and the druggist is lucky if he does not get his name published in the local medical journal as a substituter.

The physicians in the East are in some ways in advance of the physicians of other countries, in that they have reached the conclusion, and are willing to acknowledge, that "Medicine is not an art nor a science; it is an experiment." In their difficulties they often apply to one of the large firms, and will work hand in hand with them trying to obtain some new or improved remedy which will answer in certain cases. In this way many new preparations, in every way excellent, are turned out year by year, and so has originated the "elegant pharmacy" for which the large American firms have long been famous. The journals are keenly watched for new ideas and new remedies, and the American physician is willing to try them all in the hope that one may be found which will be of value. Some firms carry this idea to extremes, and will eagerly seize on and boom every new chemical "made in Germany," solely from a commercial standpoint. The enterprise of the best class of American firms might well be adopted by some of the conservative English firms.

Medicine and pharmacy are becoming more closely allied in America day by day. Large numbers of medical men own drug stores and combine medicine with pharmacy, or stick to the latter alone. The examining boards and the pharmacy college staff are largely composed of men holding medical degrees, and, though a certain section object to this condition of affairs, the results from such a course are in the main satisfactory, seeing that many of the professors originally commenced as pharmacists, and hold the pharmaceutical diploma as well as the medical.

The advance and betterment of pharmacy are largely handicapped by the foreign element. The German element, curiously enough, is the greatest hindrance; while

Germans are very numerous, and, as a rule, fairly educated, they to a large extent hold aloof from other nationalities. They form societies, and have organs of their own, and act with the obstinacy characteristic of the race. The discussions at some meetings of the Deutsche Apotheker Verein, of New York, are not edifying. Occasionally we will find one druggist calling another over the coals for seducing away one of his customers, and in general the German association is the place where the petty quarrels of different druggists find voice. It will be many years before the German, with all his education, is raised to the civilized condition of the American. Pharmacies of almost every nationality are to be found in the United States, from Italian and Russian down to the humble store of the heathen Chinee.

Distillation of Oil of Peppermint in Japan.

Interesting statements about the method of distilling peppermint oil and about the stills used in Japan have recently been published by E. Marx, showing that these stills are rather primitive. In the introduction the author remarks: "From the innovations and improvements in a 'European style' in the industries of Japan, the peppermint oil distillation has derived the least profit, notwithstanding that this branch of industry is a very considerable and profitable one, and that the production of a superior oil should be specially aimed at in the interest of the producers and of commerce. With the appliances described below this is not possible. The only remedy in this direction would consist in the introduction of modern distilling apparatus. By the use of rationally constructed stills and by careful manipulation, both the quality and the quantity of essential oils are improved and enlarged. This applies also to the manipulation of the plants during and after the cutting."

The apparatus for distillation consists of three parts, a semiglobular cast-iron kettle for the water and the herb, upon whose rim rests a wooden vat with a perforated bottom. This vat is covered by a wooden kettle, whose funnel-like bottom reaches into the vat, thus serving as a cooler. The lower funnel-like part of this kettle is filled with cold water. The vapors rising during the distillation from the cast-iron kettle are cooled upon the lower sides of the funnel and are received in a beaker hanging under the tip of the funnel. From this beaker the distillate flows through a bamboo-tube into a Florentine flask. From this the water separated from the oil is returned through another bamboo-tube into the kettle, partly replacing the loss by evaporation. Upon each fireplace three such distilling apparatus are placed, the fire being under the larger one, while the next two, gradually somewhat smaller, stills are sufficiently heated by the hot current passing underneath, from the fireplace to the chimney.

When the water in the upper wooden funnel gets warm, it is drawn off by means of a syphon constructed from bamboo-tubes, and is replaced by cold water. The flow through the syphon is started each time by sucking. As the Japanese laborer takes matters easy and indulges much in smoking, it not rarely happens that this part of his care is neglected; so that the water in the wooden funnel, serving for cooling, reaches the boiling point. Then the apparatus sends off steam saturated with peppermint oil and the whole room becomes filled with these vapors. The laborer has to suffer for his carelessness, since he burns his mouth each time when starting the syphon by sucking, but this does not seem to annoy him much, his pipe is soon again in its place and the same operation may soon be repeated with the greatest unconcern. Sometimes it also happens that the water in the cast-iron pan boils down, and that the herbs as well as the material, mostly straw, by which the rim of the pan is made tight, commence charring, whereby empyreumatic products are formed and enter the oil. This can take place also at a low level of water in the pan, whereby the upper parts of the cast-iron pan may become overheated. These facts may account for the peculiar empyreumatic by-odor frequently noticed in Japanese peppermint oil. (Schimmel's Report).

PHARMACY FOR WOMEN.*

To-day Southern women are looking around to find some avenue of labor open for them. The ante-bellum idea that fathers and brothers must support the loved and honored mothers, wives and sisters, is passing away. The old idea that work is honorable for men and not for women is no longer so prevalent.

Time was when a woman who did manual labor was not considered a lady. Too often the bread of idleness and dependence was both scanty and bitter to the taste. There are many yet who think a woman loses her standing in society, and something of her ladyhood, by becoming a wage earner. But I believe the number who oppose work for women is growing fewer, or rather to be more exact, it is the idea of receiving pay for labor, just as a man does, which they dislike so much.

All present can call to mind some family, perhaps a widowed mother and two or three sisters, all sitting helplessly around, while the brother toils unceasingly to support them. He must not marry till the sisters are provided with husbands; he dare not add another burden, for already he has a larger number in his household than he can provide for comfortably.

These daughters have no recourse except to marry. How sad, how pitiful this seems to independent women, who have an occupation by which they can and do earn their daily bread. If you speak to the feminine portion of such a family you will hear say, "Brother has such a hard time." But the thought never seems to come to them that they may by their efforts lighten his burden. Such people cannot be helped by teaching or preaching.

But to the women and girls who are willing to do "whatsoever their hands find to do," I write. First, as to the pleasure of the work: No woman who has worked and earned money ever forgets the thrill of pleasure that came to her with the payment of her first wages. Though they were but small, they were her own, the result of the work of her hands or brain, and a feeling of delightful independence came to her that is worth many years' work to obtain. Visions of travel, of study, of art, elocution, or whatever she most delights in, come to her, and she builds air castles to her heart's content. Let me tell you, sisters, that many a woman has it in her power to see her air castles a reality in after years if she only works steadily in keeping one aim in view and making all means tend toward that consummation.

Now, we will assume that all present believe that work is honorable and desirable for women as well as for men. Then we have only to discuss the kinds of work we will do. I have been selected to present to you for your consideration the subject of "Pharmacy for Women."

This is comparatively a new avenue for women, but is a very desirable occupation for many reasons, and I can not call to mind any reason why a woman should not be a pharmacist. Looking at the business from every point of view, there is but one objection to a woman's being a pharmacist, and that is that she will be doing the work some man might perform, and this objection applies equally to many occupations that women now follow.

Recently a woman applied for admission into the Virginia State Pharmaceutical Association. Two of the members opposed her admission. One said in substance, "Women are not the mental or physical equals of men, nor were they intended to be. If you encourage women to enter the profession they will and generally do work for less than men, and so the prices paid men will go down, down, until a price is reached where they cannot honestly live. No; this so-called emancipation of women is a delusion. Woman's place is in the home and not in the field of business." However, that woman was voted into the society. Texas pharmacists do their women members more honor. A lady is at this time third vice-president of the State Association and has always been treated with distinguished courtesy when present at the meetings of the society.

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*Paper prepared for the Texas Woman's Council by Mrs. H. M. Cunningham, of Houston, Tex.

A pharmacist must be careful in little things; even the drops must often be counted. Here a woman is particularly suited, for her home training has already taught her to be exact and precise. Another reason which an exchange gives is that women are not addicted to the vices to which many men are victims. They do not smoke, chew tobacco, drink nor gamble. They are more honest as clerks; very seldom does a woman steal from her employer. They are neat both in their dress and surroundings, keeping the store in an attractive manner.

The work is light, even in stores where only men are employed the heavy lifting and cleaning is done by a porter. So no objection can be made against it on that score. The work is agreeable. There is genuine satisfaction in preparing and sending out a neat looking box of pills, or a correctly prepared and labeled bottle. There is Sunday work in large cities. In smaller towns it is customary to open only on Sunday to fill prescriptions, as they may be required.

A leading druggist in a large Texas town, when the question of having a woman in the drug store was broached, said that his opinion was that it would drive away trade. That was some years ago. To-day he advertises largely the fact that ladies coming into his store will find a lady clerk to wait upon them in certain departments. I wish to give the physicians due credit here. So far as my experience goes, they have always favored the lady druggist and approved of her work.

Now the woman who wishes to enter this field of labor will naturally ask, "How can I fit myself for this work?" First is needed a good education, paying particular attention to Latin and mathematics. After this is obtained one may either go into a drug store and work, study and learn all one can about the different drugs, their properties and uses. Learn to identify them by sight, feeling or odor. After one or two years in the drug store, go to some school of pharmacy and take the two years' course—or the two years' course may come first. Most colleges now refuse to grant the graduate a degree until he or she shall have completed two years of actual work in a drug store. So it seems the better way is to work two years in the drug store before taking the college course.

I copy a few words from a drug journal: "Pharmacy is comparatively a new field for woman, but there is no gainsaying the fact that she is honoring herself and it by the success she is attaining in it. There is still a large amount of conservatism and prejudice on the part of the public to be overcome, but this is being fast accomplished, and little or no surprise is now manifested by the customer when his prescription is compounded by a woman dispenser. Much was done to popularize this sphere of activity for women through the maintenance by women of the drug store at the world's fair in Chicago. She demonstrated there that she is particularly adapted to the profession and that she especially possesses that deftness and delicacy in manipulation necessary to proper prescription compounding. To-day there are many women druggists in this country. The public is beginning to recognize pharmacy as a perfectly legitimate profession for woman. She finds it congenial and herself well adapted to its requirements, and there is no particular reason why it may not prove a specially inviting avenue of occupation. She is cordially welcome."

Here is an extract from a woman's letter to women on the same subject: "I have been asked why we have not more women engaged in the practice of pharmacy, and I have received no satisfactory reply. Girls, is it not because you are afraid of study and responsibility and work? Yet the occupation is a particularly pleasant one, if you enter into it with your whole heart and soul—which is the only way to make a success of anything, by the way—and overcome the first obstacles and live down the first difficulties with willing hands and a cheerful heart. If you are a young lady who desires something nice to do until you find a husband, or until the ship for which we have all been waiting so long, comes in with wind-blown sails, laden with costly treasures, then do not turn your eyes to pharmacy; for pharmacy has more masculine failures who are just loitering around waiting for something more profitable to present itself, than she knows what to do with already. But if you are a young woman who must use your straight strong arms and quick, clear brain as a bread winner, and if the possibility of marriage is a secondary consideration, then, if you have patience and a stout heart, do not be afraid to start out bravely side by side with the youth who goes into a drug store—for in this country pharmacy and the drug business are twin brothers—and begins at the bottom of the ladder, working his way upward round on round. In a drug store presence of mind is absolutely indispensable; one mistake, one instant's wandering thought, may mean death to some one. Again, there is a strong prejudice against women in drug stores. This may be lived down. I tell you, because I know; I have seen it lived down. Why, a bright, quick-witted, independent, yet modest girl, must succeed. There can be no such thing as failure for her. But you must be pleasant, cheerful, obliging, never satisfied with what you know, but always seeking further knowledge, keeping abreast of the changes of the time. Good drug clerks are in demand everywhere at good salaries, while poor ones are not wanted at any price. Whenever you see a drug clerk, at least in the West, complaining that he cannot get a situation, you may set it down there and then that there is something wrong with him.

"There is another recommendation for pharmacy; prescriptions will never be filled by machinery. Telegraphy may go; everything else may be ground out by machinery, but prescriptions must always be filled in the good old-fashioned way; and I believe they are not nearly so bad to swallow when a fresh complexioned young girl with delicate touch has prepared them, and gives them to you with a bright glance and a modest smile, and a something about her manner that means she is a business woman as well. The hours in this business are long, but you must obviate this difficulty; make yourself so necessary to your employer—until you have a pharmacy of your own—that he will cheerfully make concessions on this point. I once heard a gentleman say: "Do you know, I would walk six blocks out of my way to buy some trifle at D.'s drug store, simply because there is a young girl in there whom it is a pleasure only to see. She is always cheerful, always clear-eyed; she gives you a steel pen as graciously as though she were making a $5 sale; and what is more, she smiles as sweetly and as kindly on an old woman in rags as she would at a prince. D. understands just what she is worth to him, too, and not only pays her a good salary, but also favors her in the way of hours.' Remember, you may make yourself necessary to your employer in any business or profession, if you only have patience, cheerfulness and will. So don't allow incapable young men to stand or lounge behind all the drug counters in this fair and free land."

Texas has a school of pharmacy, a branch of the State University, located at Galveston. It opened its first session Oct. 2, 1893. The degree conferred is Ph. G. If you wish to gain a thorough knowledge of pharmacy the study must be undertaken systematically and in earnest. Systematic study is best accomplished in a school of pharmacy, but if it is impossible for you to undertake such a course, then the following course of study and reading is given, as prepared by Dr. A. B. Prescott:

1. General chemistry, first principles. Attfield or Shephard.

2. Study of inorganic chemicals in the store—referring to U. S. P.

3. Operative pharmacy; Remington, part 1.

4. Botany, Gray.

5. Organic chemistry, Attfield or Remsen.

6. Practice in the conversion of weights, volumes and chemical proportions; reference reading.

7. Study of the crude drugs of the store, their constituents and products; doses; reference to reading.

8. The poison effects of medicines; doses.

9. Extemporaneous pharmacy; prescription difficulties. Language of prescriptions and practice in their interpretation (Remington, part 5; Gerrish on Latinity, reference reading).

10. General pharmacognosy and pharmacy. A study of drugs, preparations and operations of the store. Reading by reference to the books already named, the dispensatories, etc. Reference reading of the periodical literature.

Besides this there is Oldberg's "Course of Home Study in Pharmacy," which is an excellent system of imparting instruction, and receiving replies through correspondence in conjunction with systematic study of the text books advised.

The article concludes with a sketch, clipped from the Era, of a prominent lady druggist who has made a success of her business.

(For the Era.)

Vanadium and Some of Its Uses.

By JOHN M. TOBIN.

The chief source of vanadium is vanadate of lead, which is usually found associated with magnetic iron, gold and silver. Vanadium is found in various places throughout the United States—Phœnix, Ariz.; Lincoln, Neb.; Texas, Mexico and Connecticut, the percentage varying from five to twenty, according to concentration of ore.

Its chief use is in the manufacture of ammonium vanadate, which is used entirely in the arts, in dyeing, inkmaking and photography. It has not been used to any extent in medicine, but lately has been used as a test for the alkaloids.

Manufacture of Ammonium Vanadate.—The concentrated ore is fused with nitrate of potassium and dried carbonate of sodium in black lead crucibles. After cooling it is ground very fine, washed with boiling or hot water several times, solution concentrated, and saturated with ammonium chloride (free from iron), which precipitates ammonium vanadate in very fine powder. Filter and dry at room temperature. Wood and iron vessels must be avoided, as both discolor the salt; the former from acid tannic, the latter from the iron.

Further purification may be effected by repeated fusings with nitrate of potassium and sodium carbonate, etc., as above, and again precipitating with ammonium chloride.

The following formula produces a very satisfactory photographic developer:

Vanadium pentoxide	1 dram
Sulphuric acid	2 drams
Water	2 ounces

Add metallic zinc in excess; after effervescing has ceased, and solution is lavender colored, filter quickly and cork tightly. One dram of above solution to one pint of water makes a very good developer, and is intensified by dilute acetic acid.

The concentrated solution does not keep well, but can be quickly restored to activity by adding sulphuric acid and metallic zinc in excess, until lavender colored, as originally.

In attempting to make vanadium bronze from copper sulphate, ammonium chloride and vanadate, I added sulphuric acid and metallic zinc, and allowed the solution to remain over night in a pitcher, which latter I found the following morning coated with a deposit of brilliant metallic copper, resembling highly burnished copper. I have repeatedly tried to duplicate the experiment, but have not been able to do so.

OILS OF PEPPERMINT, ROSEMARY AND LAVENDER.

From Schimmel's October Report.

OIL OF PEPPERMINT.—The supposition that peppermint oil contains a small percentage of amylic alcohol has been verified. In rectifying large quantities of oil, we have succeeded in isolating therefrom amylic alcohol and identifying the same by its boiling point, as well as of that of its acetate, and finally by the saponification factor of the latter. American peppermint oil contains traces of sulphur compounds which exercise a notable influence—and not a favorable one—upon its flavor. By fractional distillation a very volatile fraction of oil of an obnoxious odor and with a boiling point of 40° C. is obtained. When a few drops of this fluid are ignited in a covered, sufficiently voluminous, dry beaker-glass and the interior walls of the beaker rinsed with a few drops of water, the fluid there oxydized by a few drops of a very dilute solution of potassium permanganate and the solution subsequently boiled until discoloration ensues, it renders, upon the addition of one drop of a test-solution of barium chloride, an abundant precipitate of sulfate. We first supposed the presence of carbon disulfide, which exists in several essential oils, as for instance in mustard oil. Experiments for verification, as for instance the transformation into potassium and copper-xanthogenates, the formation of ammonium rhodanate by means of alcoholic ammonia, and the action of phenylhydrazin, rendered negative results. Nor was there any evidence of the presence of mercaptan, since no precipitates could be obtained with mercuric oxides, nor with an alcoholic solution of lead acetate. An aqueous solution of mercuric chloride, however, promptly produced a voluminous, white precipitate, and platinic chloride a yellow one. Strong nitric acid exercises a violent action, but the solution contains, after continued boiling, no sulfuric acid.

These reactions leave no doubt of the presence of a sulfide ester in the oil of peppermint; according to the boiling point, this is dimethylsulfide $S(CH_3)_2$. Analyses of the precipitate obtained with platinic chloride uniformly gave too high an amount of platinum. This seems, however, to be due to a partial decomposition incurred upon drying, also indicated by a slight odor of sulfide. The formation of the mercuric-chloride compound takes place so readily that we could apply this test as an unfailing evidence of the presence of dimethylsulfide as a constant constituent in American oil of peppermint. When about 50 ccm. of the oil are submitted to fractional distillation and the first ccm. of the distillate is placed upon an aqueous solution of mercuric chloride, a white turbidity will soon ensue upon the line of contact between the two fluids. Dimethylsulfide being very volatile, oils which may have been submitted to a fractional distillation or to considerable heat may not render this characteristic reaction. American peppermint oil appears to contain other sulfide compounds with a higher boiling point, frequently noticeable by a characteristic unpleasant odor at about the middle of the distillation of larger quantities of oil.

OIL OF ROSEMARY, DALMATIAN.—Rosemary grows wild on all Dalmatian islands, but rarely on the mainland. The leaves of the plant vary much in the strength of aroma and in the amount of essential oil. The richest kind grows on the island of Solta, but has been largely supplanted by vineyards. Little rosemary is left, and itinerant distillers rarely resort to this island for distilling rosemary oil. The oil is mainly produced on the island of Lesina, which is the center of the commerce in rosemary oil. Less rosemary is produced on the island of Lissa. Both islands are covered with rosemary bushes, except where other plants are cultivated, and they are municipal property. The harvesting of the so-called rosemary woods is legally limited to a regular rotation, generally of three years. A general crop is gathered in the first year and the next two years the plants are spared as much as possible. The present year is the second one of such a recurring period of preservation. This explains the abundant supply of rosemary oil in 1894 and the small one in 1895. While the production of oil in a normal year amounts to 20,000 kilos, it has hardly reached 7,000 kilos this year. The communities rent out the privilege of using the "rosemary woods" to the highest bidder. The distillation takes place during the months of July and August in apparatus of a very primitive kind. The distillers dispose of the oil to dealers and speculators, who make advance payments. We are positively assured that no adulteration of the oil is committed in Lesina, but that this practice commences in Triest whither the larger part of the oil passes. Our requirements of the quality of rosemary oil, both the French and Italian sorts, are:

1. The specific gravity should exceed 0.900
2. The oil should be slightly dextrogyrate.
3. One part of the oil should render a clear solution with one-half and more volumes of 90 per cent. alcohol, as also 10 volumes of 80 per cent. alcohol.

OIL OF LAVENDER.—The specific gravity of pure lavender oil is between 0.883 and 0.895 at 15° C. Admixtures of alcohol and turpentine oil lower it, while spike oil and cedar-wood oil increase it. The optical rotation is from 4° to 8° lævogyrate in a tube of 100 mm. Of the common adulterants French turpentine oil and cedar-wood oil increase the rotation considerably, while spike oil diminishes it slightly. Lavender oil is remarkable by its easy solubility in 3 volumes of 70 per cent. alcohol, rendering a solution remaining clear upon further addition of alcohol of the same strength. Admixtures of turpentine and cedar-wood oils decrease this solubility, while spike oil is of no influence. Lavender oil consists to a large proportion of linalyl acetate with a small quantity of geranyl acetate. As with oil of bergamot, the quality of lavender oil depends on the amount of ester contained therein. Oils obtained from flowers coming from the higher mountain regions have the finest odor, and frequently contain as much as 40 per cent. of ester or more. For estimation of the ester, 2 g. (weighed exactly to 0.01) of oil of lavender are mixed with 10 ccm. of a semi-normal alcoholic solution of potassium hydrate in a flask having a capacity of about 100 ccm., and provided with a tube of 1 m. in length serving as a reflux cooler. The fluid is heated upon a water-bath for about half an hour. When cool, a little water and a few drops of an alcoholic solution of phenolphtalein are added, and the excess of potassium hydrate is titrated by semi-normal sulfuric acid. The amount of ester is calculated from the amount of potassium hydrate used. The reaction is explained by the equation:

$$\underset{\text{Linalyl acetate}}{C_{10}H_{17}OCH_3CO} + \underset{\text{Potassium hydrate}}{KOH} = \underset{\text{Linalool}}{C_{10}H_{17}OH} + \underset{\text{Potassium acetate}}{CH_3COOK}$$

The molecular weight of linalyl acetate is 196. The percentage of ester *x*, therefore, is calculated by the following formula:

$$x = \frac{19.6 . \frac{y}{2}}{g};$$

y represents the number of cubic-centimeters of the solution of semi-normal potassium hydrate, and *g* the weight of oil used for saponification. The amount of ester should not be less than 30 per cent.; the finest grades of lavender oil contain as much as 40 per cent. and more of linalyl acetate.

SODIUM CITRO-PHOSPHATE.—Crystallized sodium phosphate 100 p., sodium nitrate 2 p. and citric acid 13 p., are triturated together; the mixture becomes fluid and upon the addition of water to 100 cc. and cooling to 10 degrees C. deposits crystals.

ADULTERATED DRUGS IN THE BAY STATE.

Government Analysis Bring to Light Many Surprising Facts—Cheering Words about Antitoxin.

He who has the patience to peruse the 27th annual report of the Massachusetts State Board of Health, which has lately come from the press, will find that it contains a mass of carefully-prepared information bearing on the drug trade. He will find, for example, if he looks searchingly enough in the 800 pages, that the adulteration of drugs appears to be increasing. In the course of the year of 1895 the government chemists analyzed 544 samples of drugs, and found only 212 to be up to the standard, the percentage adulterated being 61. In the last dozen years the average percentage, even including 1895, has been only 35, and five years ago it was as low as 17. Doubtless there are ways to account for a part of this increase, such as a frequent examination of certain articles believed in advance to be impure; nevertheless, the showing is one which is rather startling. Bearing somewhat on this matter is the following admission:

"Attention has already been called, in previous reports, to the fact that the percentage given in the foregoing summary does not represent, in any degree, the actual ratio of adulteration existing in food products and in drugs, for several reasons; chiefly on account of the fact that the experience of the Board enables it, first, to exercise a careful selection of such articles, mainly, as are liable to adulteration; secondly, to obtain such articles in those seasons of the year when their adulteration is most common; and, third, to pay special attention to new forms of adulteration which are constantly appearing as fast as the fraud and ingenuity of the professional adulterator present them to the public."

It costs the commonwealth a good deal of money to make investigations. Exactly how much, so far as drugs are concerned, it would be difficult to say, as the items frequently are grouped in the report under the head of "food and drug inspection," and the larger part of the expense probably should be charged to the examination of groceries and milk; but the total amount set down is more than $11,000. Since 1883 the full number of drugs analyzed has been 7,860, with 5,100 up to the legal standard.

In one place the Board says: "The principal drugs found to be adulterated are as follows: Ether, distilled water, extract of licorice, compound spirits of ether, spirits of nitrous ether (all below standard, and more than half less than 50 per cent. of the required strength), the pharmacopœial wines and liquor, tincture of opium, officinal soap and mercuric ointment. Much greater care is necessary in the preparation of distilled water. Its use for preparing eye-lotions, for the solution of nitrate of silver and other salts, and many other purposes requiring pure water, calls for a carefully made article, and yet it was commonly found on analysis to be nothing but the tap-water of the city or town supply, and in one instance it contained more impurities than the ordinary sewage. It is needless to say that a conviction and fine followed upon this sale."

There are dealers in 84 cities and towns to whom notices were sent on account of the detection of adulteration. Boston leads, with Holyoke second. The number of cases entered in court was 11, and in every instance, save two, conviction followed; the exceptions being due to the sudden departure of the defendants from the State. "Ruppert's Face Bleach" caused most of the trouble, and distilled water cases were next in rank.

Touching on the subject of food preservatives, the report states that borax and boracic acid were found in samples of clam juice and shredded codfish; salicylic acid was discovered in jams and preserves; a salt sold as "fish preservative" proved to be a mixture of common salt and borax, and "oyster preservative" proved out to be a compound of salt and boracic acid. Samples of extract of vanilla contained 2.23 grains of vanillin per litre, and two others contained coumarin.

Just to show some of the discoveries made by the analysts, the following item is quoted: "Spiritus Aètheris Nitrosi:—But very few samples showed even an approximation to the pharmacopœial requirement in contents of ethyl nitrite. This drug cannot be properly kept unless in small, securely sealed bottles, away from the light, and even so it loses its strength in the course of years. Apparently but little care is exercised by druggists to observe these necessary precautions."

A sample of "unguentum zinci oxidi" was found to be composed of 10.5 per cent. of oxide of zinc mixed with plain lard; whereas the Pharmacopœia demands 20 per cent. of the zinc salt to be mixed with benzoated lard. Several samples of Mme. Ruppert's face bleach contained corrosive sublimate to the extent of about 27 grains to an 8-ounce bottle. The "Poison" labels were used, as required by law; but where? Why on the bottom of the bottle, where they were fairly certain to escape the notice of the average buyer. A sample of "Perry's Freckle Lotion" contained 39 grains of corrosive sublimate to an 8-ounce bottle; a "Recamier Balm" was discovered to consist essentially of zinc oxide suspended in water, with a trace of corrosive sublimate, and an "Excelsior Hair Tonic" was made chiefly of bay rum containing quinine. In a sample of "Pulmonine," which was analyzed, 16 per cent. of alcohol by volume was found. A "Coca-Kola" preparation contained caffein, cocain, sugar and tartaric acid; "Hunyadi Granules" were found to consist essentially of tartaric acid and bicarbonate of soda, and "Vichi Granules" were of the same composition.

In conclusion, it seems worth while to review briefly the use and value of antitoxin in cases of diphtheria. The total amount of anti-toxin serum issued by the Board during the year ending March 31, 1896, was 1,724 bottles, containing about 30,000 centimeters of serum. Boston alone was allowed 368 bottles, and Cambridge 288. The physician in charge of the experiments at the City Hospital says that: "If we compare this death rate from diphtheria of 11 per cent. since the introduction of antitoxin with that of a death rate in the hospital of 40 per cent. before the introduction of anti-toxin, there can be but one opinion regarding the efficacy of the remedy." Other physicians have written as follows:

"Improvement in 24 hours was remarkable."

"Marked improvement immediately following antitoxin."

"I consider that the use of antitoxin in his case was not only beneficial, but absolutely the only curative agent."

"Action of antitoxin marvellous."

"Without antitoxin I should have lost four patients."

"Rapid improvement from time of injection."

"Antitoxin saved this child's life."

Buchu Oil.

The constituents of the leaves of the short-leaved buchu from *Barosmo betulina* Thunb. and the leaves of the long-leaved buchu from *Barosma serratifolia* Wild, each separately, have recently been made the subject of a comprehensive examination in the pharmaceutical laboratory of the University of Dorpat, by M. Bialabrzeski. Since his object was to obtain all constituents of the leaves as much as possible unchanged, the essential oil had to be extracted by percolation with petroleum ether. The percolate, containing, besides the essential oil, resin and chlorophyll, was submitted to fractional distillation under reduced pressure; after the distillation of the petroleum ether, the essential oil passed over at 130° C. and a pressure of 14 mm. The different fractions were once more re-distilled under the same conditions in order to free them from petroleum ether; they then were purified by distillation with steam. Both kinds of leaves yielded a yellowish oil, which on exposure to the air gradually acquires a darker color. Its odor resembles that of a mixture of camphor and peppermint and its taste is bitter and cooling. Its boiling point is between 178° and 235° C.; it is soluble in nearly two volumes of caustic alkaline solutions; from these solutions the stearopten is separated in crystals upon the addition of hydrochloric acid. On cooling, part of the oil solidifies, but a complete separation of the solid from the liquid constituents could not be obtained by this process. The author has omitted to ascertain the relative proportions of the constituents of the oil. The yield of oil amounted to 1.33 per cent. from *Barosma betulina*, and to 0.84 per cent. from *Barosma serratifolia.*

From the researches of Bialobrzeski it is evident that buchu oil consists of three constituents, a hydrocarbon $C_{10}H_{18}$, boiling at 174° to 176° C., a ketone $C_{10}H_{18}O$, which is an isomer of menthone and not of borneol, and of the stearopten diosphenol $C_{10}H_{16}O_2$. The best method of separating these three compounds is fractional distillation in vacuo and subsequent oxidation of the fractions with a lower boiling point by means of moist argentic oxide; this converts diosphenol into an acid which will be neutralized and fixed by a solution of soda and subsequent distillation by steam. The mixture of hydrocarbon and ketone can readily be separated by treating it with hydroxylamine.

The hydrocarbon boiling at 174-176° C. is optically active, = + 60° 40′; sp. gr. at 0° C. = 0.8802, at 18.5° C. = 0.8647; its formula is $C_{10}H_{18}$; its odor recalls that of *oleum pini Sylvestris:* it decolorizes solutions of potassium permanganate, absorbs bromine, as also dry hydrochloric acid. A more definite characterization of this hydrocarbon is still wanting.

The ketone $C_{10}H_{18}O$ boils between 206° and 209° C. It is a colorless limpid fluid of an agreeable peppermint-like ordor; sp. gr., 0.9145 at 0° C., and 0.8994 at 18.5° C.; its optical rotation is but slight, — 6° 12′. It does not combine with bisulfite. When acted upon in a dilute alcoholic solution by hydroxylamine, a semi-fluid oxime is formed which boils under 15 mm. pressure between 134° and 135° C.; its sp. gr. at 18.5° C. is 0.9627. Its alcoholic solution (1:10) has a dextrogyrate rotation of 2° 11′. When acted upon by bromine in a petroleum-ether solution, an oily compound $C_{10}H_{17}BrO_2$ is formed buchu ketone, therefore, shows the same behavior with bromine as does *l*-menthone.

Of much interest was the further investigation of diosphenol, which Shimoyama supposed to be a phenol, probably with the character of an aldehyde; the researches of Bialobrzeski, however, have not yet fully and conclusively elucidated the chemical character of diosphenol, so that it remains to further researches to attain to this end.

Diosphenol is the only optically inactive constituent of buchu oil; to its presence is due the property of the oil to render a dark-green color reaction with an alcoholic solution of ferric chloride, as also to reduce ammoniacal silver solution forming a silver mirror upon the glass, and to impart a red color to fuchsine-sulfurous acid. It melts when pure at 82° C. and distills over under common atmospheric pressure at 232° C., suffering a partial decomposition, but none when distilled in a vacuum with a pressure of but 14 mm. It then distills at 112° C. The aldehydic nature of the compound was furthermore indicated by its reactions with hydroxylamine and with phenylhydrazine. The oxime forms slightly rose-colored laminæ; which upon being heated turn yellow at 130° C. and melt at 156° C. The hydrazine could only be obtained as a red liquid which on cooling solidifies to a crystalline mass at 0° C.

Shimoyama has, in his researches, experimented with the action of sodium amalgam in alkaline solution; he observed the formation of a compound which he supposed to be the alcohol $C_{10}H_{18}O_2$ of the corresponding aldehyde $C_{10}H_{16}O_2$. This compound is obtained in a much larger yield when, according to Bialobrzeski, metallic sodium is allowed to act upon an ethereal solution of diosphenol containing very little water. The product, containing some undecomposed diosphenol and traces of an oil, crystallizes from its alcoholic solution in slender needles which melt at 159° C, and do not render any color-reaction with ferric chloride.

A reaction which stands in contradiction with the theory that diosphenol is an aldehyde consists in its treatment with a hot alcoholic solution of potassa. According to analogy this reaction would result in the formation of the acid $C_{10}H_{16}O_3$, corresponding to the aldehyde as well as to that of the alcohol $C_{10}H_{18}O_2$. Instead, an acid is formed with the melting point at 96° C. and the formula $C_{10}H_{18}O_3 \cdot H_2O$, while part of the diosphenol remains unaltered. The same acid has also been obtained by Shimoyama, so that both investigators agree on this point. But diolacid, so named by Shimoyama, is not identical with the acid formed by the oxydation of diosphenol when acted upon by moist silver oxide or by potassium-permanganate; this acid has the formula $C_{10}H_{16}O_3$ and has so far been obtained only as an oily fluid. (Schimmel's Report).

FORMULÆ FOR WINE ESSENCES.

Black Currant.

Essence of black currant	8	ounces
Vanillin	4	grains
Gingerin	5	grains
Tartaric acid	2½	ounces
Caramel	2	ounces
Salicylic acid	½	scruple
Water	3	ounces
Syrup to	16	ounces

Triturate the salicylic acid, vanillin and gingerin with the essence gradually added. Dissolve the tartaric acid in the water, add the caramel and the essence mixture, and make up to 16 ounces with syrup. Set aside for a few days and decant. (2 ounces).

Cherry.

Essence of cherry	8	ounces
Essence of almonds	2	drams
Vanillin	4	grains
Salicylic acid	1	scruple
Tartaric acid	2	ounces
Cochineal coloring	1	ounce
Caramel	1	ounce
Water	3	ounces
Syrup to	16	ounces

Prepare like the preceding essence. (2 ounces.)

Damson.

The same as cherry, but with

Essence of damson	8	ounces

Ginger.

Gingerin	36	grains
Capsicin	2	grains
Rectified spirits	4	ounces
Water	4	ounces

Dissolve the gingerin and capsicin in the spirit and the water, and filter and add to the following solution:

Tartaric acid	8	ounces
Caramel	1	pint
Water	7	ounces

M. (2 ounces.)

Orange.

Oil of sweet orange	15	minims
Essence of vanilla	2	drams
Tincture of orange	1½	ounces
Tincture of lemon	½	ounce
Tartaric acid	2	ounces
Salicylic acid	½	dram
Orange flower water	2	ounces
Caramel	3	ounces
Syrup to	16	ounces

Prepare as above directed. (2 drams.)

(Chem. & Dr.).

TANUOSAL.—A tannic acid ester of creosote, which boils between 200° and 210°. It forms a brown, amorphous, very hygroscopic powder, soluble in all the usual solvents, free from the burning taste and caustic properties of creosote. In the intestinal tract tannosal is split up into tannin and creosote.

QUESTION BOX

The object of this department is to furnish our subscribers with reliable and tried formulas and to discuss questions relating to practical pharmacy, prescription work, dispensing difficulties, etc. Requests for information are not acknowledged by mail and ANONYMOUS COMMUNICATIONS RECEIVE NO ATTENTION.

States Having no Pharmacy Laws.

(F. A. A. L.) See Dec. 10, 1896, issue, page 760.

Applicants Passing New Jersey Board of Pharmacy.

(E. P.) For list of applicants passing the Oct. 15, 1896, meeting of the New Jersey Board of Pharmacy, see this journal, Nov. 26, 1896, page 710.

Colleges of Pharmacy in the U. S.

(F. A. A. L.) See this journal, Sept. 10, 1896, page 351. We also expect to present an article in our next issue on pharmaceutical education, which will contain considerable information about these institutions.

Soap Liniment from Oleic Acid.

(P. P.) The following formula was read before the Pennsylvania Pharmaceutical Association some years ago: Dissolve two ounces of camphor in two pints of alcohol; add two ounces of oleic acid and one-half ounce oil of rosemary, then gradually add five drams sodium bicarbonate, and when effervescence has ceased, add six ounces of water, and filter.

Elixir of Six Bromides.

(Subscriber). The manufacturers state that each fluid dram contains 5 grains each of the bromides of potassium and sodium, 3 grains bromide of ammonium, 1½ grains bromide of calcium, and ½ grain each of bromides of lithium and iron, with cannabis indica and aromatics. It is left you to determine just what pharmaceutical manipulation is necessary to make a satisfactory, finished product.

Should Gelatine Coated Pills be Dispenssed?

(Subscriber) asks whether he should prepare pills or dispense a "made up" gelatin-coated pill on a prescription written "Pil. aloin, belladonna, strychnia et cascara, No. 30."

This is a question the prescriber could best answer, although we believe it is customary to dispense a "made up" gelatin-coated pill. This statement is not intended to mean that the pharmacist should not prepare these pills. He should prepare and gelatin-coat them, too, for that matter. But how many do?

Legal Requirements for the Practice of Medicine.

(F. A. A. L.) See this journal, May 16, 1895, page 624. A diploma has in many of the States only the force of a certificate or permit, which enables the holder to present himself before the variously constituted State boards. However, in Arizona, Georgia, Idaho, Indiana, Kansas, Michigan, Nevada, South Carolina, Wisconsin and Wyoming the presentation of any kind of a diploma—provided that it be from a "chartered" medical institution—is sufficient warrant in law for county clerks, clerks of courts, registrars of deeds and similarly qualified judges of medical fitness to admit to practice. In California, Colorado, Connecticut, Delaware, Illinois, Iowa, Kentucky, Louisiana, Missouri, Montana, Nebraska, New Mexico, Oklahoma, Tennessee, and possibly two or three other States, the diploma is subject to supervision of some designated body vested by law with authority to determine its validity as evidence of its possessor's qualification to practice medicine. If the applicant possess no diploma he may acquire the right to practice by passing a satisfactory examination.

Clarifying Vinegar.

(J. K.) Various processes have been suggested for "clearing" vinegar. Filtration through felt, the addition of milk (casein), albumen, etc., have been suggested. The Era Formulary gives the following formula for a "clearing powder" suitable for vinegars, wines, liquors, etc.:

Albumen	3 pounds
Neutral tartrate of potassium	4-5 ounce
Alum	½ pound
Ammonium muriate	7 pounds

The powder must not be added direct to the liquid to be cleared, but should first be mixed with soft water. About 20 grains of this powder are said to be sufficient for clearing a gallon of fluid.

Lethian Liniment.

(E. M. K.) Dr. Chase says that Dr. Tilman Douglass gives this name (lethian—forgetfulness of pain) to the following preparations: Digest a bar of fresh turpentine soap and 4 ounces of gum camphor in 1 gallon of alcohol in a warm place, for two weeks. While hot, bottle in 4-ounce, large-mouthed bottles, each containing 1 dram of chloroform; shake occasionally until the mixture coagulates like opodeldoc. If turpentine soap cannot be obtained take common bar soap and add 4 ounces of turpentine with the camphor. To apply, coat the part well and cover it immediately with paper which will adhere firmly, producing a gentle burning, tingling sensation. Useful in neuralgia, rheumatism, cramps, colic, etc.

Artificial Lime Juice.

(J. G. F.) In farther reply to your query (this journal, Dec. 3, p. 728) the following may be of service:

Citric acid	10 drams
Potassium carbonate	14 grains
White sugar	2½ ounces
Water	1 pint

Dissolve, add the peel of a lemon, infuse for twenty-four hours, and strain through a hair sieve. This preparation will retain its composition and flavor if kept in a cool place. For lime-juice cordial, digest fresh and dried lemon-peel, of each 2 ounces, and fresh orange peel 1 ounce, in a gallon of proof spirit for a week; strain and press, and add water, sufficient to reduce it to desired strength, and lump sugar 3 pounds to the gallon. The addition of a little orange flavor or rose water improves the flavor.

Milk Adulteration.

(C. F. T.) The addition of any substance to milk to increase its specific gravity or "enrich" it after the cream has been removed is regarded as a violation of law in most of the States, and you cannot afford to lend yourself to any scheme of this kind. A "milk" loaded up, as is sometimes done, with a mixture of common salt, saltpeter, saleratus, a trace of caustic soda and a large amount of sugar (colored with caramel) is not milk, and you should do your part in "showing up" any person using it or any other compound. Treacle, salt, turmeric, carbonate of soda, etc., have all been used to "improve" the flavor and appearance of skimmed milk, but such products are usually so easily detected that no one, though he be entirely lacking in what constitutes moral obligations, would care to run the risk of using them for this illegal practice.

Enteric Gelatine Capsules.

(G. F.) Salol is sometimes used as a coating for the same purpose as keratin, viz.: for pills intended to pass the stomach undissolved. This coating may be applied to gelatin capsules. Coblentz gives the following instructions: The pills (capsules) should be impaled on needles (as in coating with gelatin); then dipped into the melted salol contained in a small, deep capsule. The coating hardens almost as soon as the pills are removed from the bath. Such pills have the appearance of being sugar coated. The holes left after removing the needles should be closed by applying a little melted salol with a brush. A coating of 0.2 to 0.3 grams of salol suffices to prevent the pill from being crushed by the pressure of the tongue against the palate. The pills must not be bitten and not be taken with hot food or fluids. It has also been recommended to dip the pills into a saturated (hot) alcoholic solution of salol containing a small amount of shellac.

Effloresced Epsom Salts.

(Subscriber) asks if epsom salt which has been exposed to the action of the atmosphere loses any of its laxative properties.

No; but the laxative or cathartic effect of a given weight of the salt probably varies with the amount of water of crystallization present. Usually the dose of a dried salt is less than that of the same salt in crystalline form. However, epsom salt is always exhibited in solution. According to Hay and others, it is a purge by reason of its abstraction of water from the intestinal blood vessels. All strong saline solutions above the strength of 7 per thousand, says Hare, abstracts liquids from the tissues when brought in contact with them. On the other hand, if a saline solution be less strong than 7 per thousand, it will abstract salts from the tissues and replace them with water. From this he argues that whenever a thorough purgative action is required, that is where depletion of the intestine or absorption of exudations is to be attained, the salt should be given in concentrated form, so as to make its solution of as high a percentage as possible.

Baking Powder.

(J. F. C.) Here are some formulas taken from a paper read before the Georgia Pharmaceutical Association several years ago by Dr. George F. Payne, of Atlanta. The figures are based upon the tartaric acid selling by the ton at 25 cents a pound, cream of tartar at 22½ cents, acid phosphate of lime at 7½ cents, dried alum at 4½ cents, starch at 2½ cents, and bicarbonate of soda at 3⅛ cents. That these powders should keep well, each ingredient should be first thoroughly dried by a gentle heat, and they should be kept securely closed in dry fruit jars, corked bottles or sealed cans.

(1)	Tartaric acid	1 pound
	Bicarbonate of soda	1 pound
	Starch (powdered)	½ pound
	Costs about 11¾ cents a pound.	
(2)	Cream of tartar	2 pounds
	Bicarbonate of soda	1 pound
	Starch (powdered)	¾ pound
	Costs about 13⅓ cents a pound.	
(3)	Acid phosphate of lime	1½ pounds
	Bicarbonate of soda	1 pound
	Starch (powdered)	1¼ pounds
	Costs about 4¼ cents a pound.	
(4)	Acid phosphate of lime	2 pounds
	Dried ammonia alum	2 pounds
	Bicarbonate of soda	3 pounds
	Starch (powdered)	5 pounds
	Costs about 4 cents a pound.	
(5)	Dried ammonia alum	1 pound
	Bicarbonate of soda	1 pound
	Starch (powdered)	1 pound
	Costs about 3½ cents a pound.	

To the above cost should be added the cost of the containers and the time consumed in doing the work. The ingredients, all finely powdered, should be first sifted separately, to get rid of all lumps, then the soda and starch should be well mixed together, and finally the acid ingredients should be added, and all thoroughly incorporated, either by rubbing together in a mortar or by sifting at least three times. Flour can be used in place of starch, and is considerably cheaper.

A recipe is given for each variety of baking powder. The amount of starch can be increased in any of the recipes, the other ingredients being left the same, and in

CORRESPONDENCE OF INTEREST TO OHIO DRUGGISTS.

Cleveland, O., Dec. 14, 1897.

Hon. J. E. Blackburn, State Food Commissioner, Columbus, O.

Dear Sir:—I am in receipt of numerous communications in reference to your decision regarding proprietary medicines containing powerful alkaloids; will you kindly inform me, so I can notify the members of our association, and druggists of the State, what preparations or class of preparations are affected by said decision or law referring to the labeling of preparations containing powerful alkaloids, or the label required under the Poison Label Law.

If you will kindly furnish me a list of the preparations requiring such labeling, I am sure the druggists will be grateful; for a more law-abiding body of men cannot be found in the State.

Awaiting your early reply, I remain, yours truly,

LEWIS C. HOPP, Secretary,
Ohio State Pharmaceutical Ass'n.

Columbus, O., Dec. 18, 1897.

Mr. Lewis C. Hopp, Sec'y, Ohio Pharmaceutical Ass'n., Cleveland, O.

Dear Sir:—I acknowledge receipt of your favor of Dec. 14, asking me to define my official position on the question of the poison label law. I take special pleasure in complying with your request, the more so as my position has been persistently misrepresented on this question.

For many months past complaints have been made to this department that certain proprietary articles, commonly called patent medicines, contained an excessive and dangerous amount of poisonous drugs and were exerting a very deleterious and injurious effect upon many people who were induced to use them. This led to an investigation and the records of this office show the complaints were well founded.

As a matter of right, fairness and justice, I do not see why a druggist should be compelled to label cocaine, morphine and chloral hydrate "poison," and permit these same drugs to be sold generally and indiscriminately in simple mixtures without bearing the cautionary label. It occurred to me that these dangerous preparations should contain the same warning that the druggist is required to use on his every day sales of the same article, or that the druggist should be treated with the same consideration that patent medicines are, and omit the poison label. As the latter proposition would work still greater injury to the public, and one scarcely to be considered, I have seen fit to institute proceedings against several proprietary articles for the purpose of testing this statute.

Should such rulings sustain the department every druggist will be expected to comply with this law upon the receipt of proper notice. As I know from personal acquaintance that there is not a more honorable or conscientious class of business men in any State than the druggists of Ohio, I apprehend that the law will be cheerfully observed in this as it is in all other matters applying to their profession.

I have suggested to some of the manufacturers that they omit the dangerous drugs from their preparations, as the simplest solution of the problem, but they have not seen fit to do so. If the manufacturers of such preparations wish to take the position that their goods derive their merit from the use of narcotic poisons, I have no wish to take issue with them upon this question.

This phase of the question is fully considered in a letter to Messrs. Scott & Bowne, as follows:

Office of Dairy and Food Commissioner,
Columbus, O., Nov. 23, 1897.

Messrs. Scott & Bowne, New York.

Gentlemen:—Information has come to me in my official capacity that you are the manufacturers and vendors of a preparation styled "Scott's Emulsion of Cod Liver Oil." The official chemists in connection with the department certify to me that the said preparation does not contain the ingredients that you represent it to contain, and further, the chemists located in various parts of the State have reported to me that your preparation, the said Scott's Emulsion of Cod Liver Oil, does contain a salt of opium, known as morphine.

As morphine is admittedly a deadly drug and extremely dangerous on account of its narcotic properties, my duty in the premises is plain. Any intelligent person will admit that a powerful drug like opium, or any of its salts, should not be administered in the guise of a food. With these facts before me, I have felt it my duty to institute proceedings, under the statutes of this State governing the sale of poisons, to prohibit the sale of your preparation.

In order to save your customers the penalty they will surely incur for selling this article, I respectfully suggest that you withdraw the goods from sale in this State, and thus relieve yourselves and the business men of Ohio from annoyance and expense of further litigation in this matter

I am moved to make this suggestion after an extended talk with your Mr. Griffith on this subject, and believe this to be the most satisfactory solution of the problem, as your goods cannot be legally sold in Ohio on and after this date. Respectfully submitted,

J. E. BLACKBURN,
Dairy and Food Commissioner.

As Messrs. Scott & Bowne have taken the liberty of making part of this correspondence public, I do not see any impropriety in publishing the rest of it. I shall be pleased to hear from you at any time upon this or any other subject pertaining to the department in which you feel an interest.

With assurances of kindest esteem and fair play for all concerned, I am, very truly yours,

J. E. BLACKBURN,
Dairy and Food Commissioner.

DIAMIDORESORCIN: PHOTOGRAPHIC DEVELOPER.—This is a new developer derived from aromatic series and christened with an English name. (Photo. Gaz., Sci. Amer.) Ortol is one to which Lumiere & Leyewetz have already given considerable attention. The properties of this developer are essentially the same as those of amidol, but with some additional qualities. It can, like amidol, be put up in powdered form and be easily dissolved when wanted. One of its advantages over amidol is that its action may be considerably retarded by bromide of potassium, which allows, to a certain extent, the correction of any errors due to overexposure. The following is the formula: Water 100 gms.; anhydrous sulphite soda 3 gms.; chlorhydrate diamidoresorcine. If the proportion of the diamidoresorcin is increased or diminished the reducing power is lessened and the image lacks vigor in both cases. By increasing the quantity of sodium sulphite the reducing or developing power is proportionately increased, 10 grams of sodium sulphite being the limit, however. An excess of sulphite beyond the amount mentioned is liable to produce fog. The solution slowly changes; after eight days its reducing power is considerably weaker, but as has been previously mentioned, its rapid solubility permits the developer to be quickly prepared and thereby renders the keeping of a stock solution on hand unnecessary.

GUTTA-PERCHA consists of a mixture of three resins: gutta, $C_{20}H_{32}$; fluavile, $C_{20}H_{32}O$; and albane, $C_{20}H_{32}O_2$. The first is the body to which the material owes its industrial value, and it forms from 40 to 85 per cent. of the whole. At 10° to 20° C. it is white, soft, but not elastic; at 45° it becomes yellow and pasty; between 100° and 110° it softens; and at 130° it melts, boils, and is decomposed into an oil and a gaseous hydrocarbon. Gutta is soluble in chloroform, toluene and carbon bisulphide; insoluble in dry alcohol, and also ether—at least after treatment with the former. It oxidizes in the air and is decomposed by hot nitric acid, formic and hydrocyanic acids being formed. Hydrochloric acid converts it into a dark brown substance. Fluavile is a yellow, brittle, amorphous resin, softening about 50°, and melting at 100° and 110°. It is heavier than water. It dissolves cold in dry alcohol and ether, benzene, toluene, oil of turpentine, carbon bisulphide and chloroform. Strong alkalis, weak acids, and concentrated HCl are without action. Albane is a white resin, crystallizing from hot alcohol, softening at 160° and melting, without decomposition, at 175° to 180°. Its solubility resembles that of fluavile, except that alcohol only takes up 5.1 per cent. in the cold and 54 per cent. at the boiling point. In presence of acids and alkalies it also behaves like fluavile. Attempts to value the gutta-percha of commerce should be based on the determination of the proportion of pure gutta, moisture and other impurities.

AN APPEAL FOR AGGRESSIVE ETHICAL PHARMACY.

By LOUIS EMANUEL.

Verily, "there is nothing new under the sun," not even in the condition of pharmacy as we find it to-day, judging from the following, printed in the American Journal of Pharmacy, in 1854, from the pen of Prof. Edward Parrish:

"The natural enemy to the profession of pharmacy is the quack. Of all the species of this parasitic genus (some species of which infest every profession), the most characteristic and well-defined is the manufacturer of secret medicines or nostrums. Depending upon ignorance and credulity for support, the medicine quack is interested in suppressing the growth of intelligence. His interest would be promoted by reducing every drug store to an agency for patent medicines, or a store for general merchandising, and every pharmacist to a mere salesman and shopkeeper. * * * *

"What wonder, then, that, as a profession, dependent upon public patronage for support, we are completely prostrate; that we scarcely can, if we would, act a manly and independent part? The druggist must make a living; this is the great motive power in his as in every other business, and, in many instances, his bread and butter would fail, if, eschewing all quackery, he would hold up, by example and precept, a dignified testimony to his honest convictions. It is true that he may keep a tolerably clear conscience, as men can in almost any pursuit, by a sort of compromise between interest and duty. That this is the position of the great majority of druggists in regard to quackery, is well known. I believe it is mainly the result of our past neglect to avail ourselves of the advantages within our reach, and may be entirely obviated, and the profession of pharmacy raised to its true dignity and importance by uniform and well-directed efforts in the future. * * * The relations of the druggist with the physician, if properly maintained, would be found to give him an immense advantage in his warfare with quackery. So long as he pursues his calling with just regard to the rights and interests of the medical profession and the public, and lends the weight of his influence against the common enemy, he will have the support of all wise and liberal physicians. In strengthening the hands of these, he will be rearing for himself the strongest defense against the destructive competition of the unprincipled quack. * * * *

"Let us, then, with a hopeful reliance upon the strength of our cause, labor to rescue our honorable and useful profession from the embrace which has so long choked out its vitality and cast reproach upon its character, and in good earnest seek to infuse into it a vigorous and manly spirit, which shall result in its independence, its growth and improvement. * * *

"The cultivation of a pharmaceutical literature among ourselves, which shall make pharmacology, instead of a secondary branch of medical knowledge, a distinct department of science pertaining to a distinct profession, is an object greatly to be desired and promoted by every legitimate effort. This, of course, will require some skill and judgment. It should be diffused as a sort of antidote to the puffs of quackery. It should be done without the appearance of antagonism, without any pointed allusions, but in a manly and dignified spirit, with a direct view of diffusing knowledge of the true nature of the healing art, and, I believe, in this would be found our strongest weapon against quackery."

In the same year the American Pharmaceutical Association adopted the following resolution: "Resolved, That the letter of Mr. M., in reference to securing uniformity in the preparation of unofficial preparations, be referred to the Executive Committee, with instructions to request the forwarding to them of such local formulæ as pharmacists may wish to communicate."

The committee, in explanation, says: "It has reference more particularly to recipes of unofficial preparations prescribed by physicians, and for which there are no generally recognized formulæ—as Dewees' carminative, syrup of morphine, tincture of arnica, etc., and it is the intention of the association to publish them in a compiled form for the benefit of all."

This, I presume, was the leaven which, in due course of time, gave us the "National Formulary" of the present day; but how do we stand to-day with a Pharmacopœia second to none, and a National Formulary which is of great merit, but with physicians who do not employ the preparations of either? And why is this? Simply because the preparations nominated in either of these books are common property, and as it is often said—"What is the business of all is the concern of none." It does not pay the manufacturer to confine himself to their manufacture; therefore, he finds a way to create a demand for his higher-priced nostrums. These latter are judiciously advertised through the medical press, and in a hundred other ways, in which Satan himself seems to aid him, so that they have crowded out most of the legitimate preparations. By constant and systematic advertising the nostrums are kept constantly before the physician, who, like Pope's description of vice, first endures, then pities and then embraces. He cannot forget them, even if he willed, consequently he forgets all about the Materia Medica of his college days. The manufacturer, in order to control the sale of his nostrum, resorts to the copyright law, by coining a name more or less characteristic of an ordinary preparation or compound, and charging an extra profit. This enables him to advertise extensively, which he does first among the medical profession, until the latter has introduced the preparation; then after the physician has made the preparation known, the manufacturer turns to the public for patronage.

Now, how can this state of affairs be changed? How may we stem the tide, and make it flow in the right direction? The method is the same as that adopted and persistently carried out by the manufacturers, namely, printers' ink. Let the medical profession be lighted by the beacon of ethical pharmacy in an aggressive manner! The remedy is in the hands of the retail pharmacist, but not as an individual, because of the cost entailed, and because of the temptation to become a trade-mark-manufacturing pharmacist.

With the Immortal Bard we, as pharmacists, can say:

"Our legions are brimful, our cause is ripe:
The enemy increaseth every day:
We, at the height, are ready to decline.
There is a tide in the affairs of men,
Which, taken at the flood, leads on to fortune;
Omitted, all the voyage of their life
Is bound in shallows and in miseries.
On such a full sea are we now afloat;
And we must take the current when it serves,
Or lose our ventures."

And now is the tide at its height! Now, when time hangs heavy for lack of something to do, when no profit is reaped from the sale of nostrums. Now is the time when the pharmacist should reach for a higher step on the ladder of pharmaceutical enterprise. But how is the step to be taken in order that the laborer, who is worthy of his hire, shall reap the profit thereof?

The establishment of a literary bureau by the State Pharmaceutical Association is the first move in this direction, and if every pharmacist of the State was a member in good standing, the matter would be simple enough. The expense of compiling and disseminating pharmacal and therapeutical information among the medical profession would be shared by all alike; but as only a small minority of the pharmacists are members of the association, it would be feasible to have the bureau compile literature consisting of clinical reports on (1) U. S. P. products, (2) N. F. preparations, and (3) new non-proprietary remedies, the merits of which are established either by the bureau or other sources. Early in the fall, N. F. emulsions of cod liver oil, Lin. Tiglii N. F., Syr. Pinus Comp. and preparations of like character should have attention. In the summer, Tr. Kino, Tr. Catechu, Syr. Hydriodic Acid, Naphtol, Naphtalin, etc., would make good reading matter. The information may be conveyed in letter form or in the nature of a bulletin, issued on the authority of the association. Each member desiring copies of said literature may draw on the bureau for as many copies as he may need for distribution among physicians in his locality, bearing the distributer's imprint.

The expense is to be borne pro rata by each member using the literature. The advantage of having the bureau compile and publish the matter lays in uniformity and economy. Much of the subject-matter may be gleaned from the pharmacal and medical press, as, for example, a year or so ago a very good article appeared in a medical journal on "Fel Bovis Purificatum," which resulted in an increased number of prescriptions for this official product. Now, if a reprint of this article were distributed occasionally, especially during the summer months, it would help to crowd out non-official products, which the manufacturer is constantly pressing on the attention of the medical fraternity, while the pharmacist is standing about with his hands in his pockets, lamenting the degeneration of pharmacy, and waiting, like Wilkins Micawber, "for something to turn up."

It is now some forty years since "acetanilid" was first made, and seven since it has had official recognition (and here let me remind you that it costs 35 cents a pound, and that a certain manufacturer sells it at 25 cents an ounce simply because he sells it under a copyrighted name); and there are many physicians who are unfamiliar with it, although they may be familiar with and prescribe antifebrin, under which name it was brought to the attention of the medical profession by an aggressive manufacturer. (For a record of literature on acetanilid, see National Dispensatory, fifth edition.)

Pharmacy has been too conservative, and is hiding, as it were, its light under a cover of indolence. I would have her arouse herself from her torpor, and have her use the same aggressive methods as are used by the manufacturers in extolling his products, and she will find how eagerly the majority of the medical profession will respond to her call!

Let me suggest that the bureau begin with carvacrol iodide, a substitute for iodoform, made by treating an alkaline solution of phenol-carvacrol with iodine, and which seems to possess superior therapeutic worth. Prepare the product and report on its chemical properties, and the hospitals could supply the clinical reports. If the new compound evinces, on use, any special therapeutical merit, it will not be long until it will be popular; but if we leave it for the enterprising manufacturer to confiscate, and secure for it a copyrighted name to aid him increase his profits, it will prove an additional nail in the coffin of ethical pharmacy.

Pittsburg, Nov. 1, 1897. (Alumni Report.)

TO RENDER CELLULOID INCOMBUSTIBLE, it is recommended to dissolve one part celluloid in 5 parts acetone. To 5 parts of this solution is added one part of a solution containing 1 part magnesium chloride in 3 parts alcohol, the whole thoroughly mixed and dried. The product is entirely incombustible.—(Drog. Ztg.)

HYDROGOL AND ORGANOSOL.—By these names are known two solutions of colloidal metallic silver, the first being prepared with water, the second with organic solutions, e. g., alcohol. They are expected to replace other silver preparations for hypodermic use. The solutions are stated to be prepared from silver nitrate by means of reducing agents.—(Ph. Post.)

COLORS USED IN THE MANUFACTURE OF SOAP.

The colors from which the soapmaker may select are exceedingly numerous, for not only are most of the aniline colors adapted for this purpose, but also a very great number of mineral colors. Until a comparatively recent time the latter were probably exclusively employed, but the advance in the tar color industry in later years has brought about a not inconsiderable change in this respect. A very prominent advantage of the mineral colors is their stability, i. e., not being changed or in any way affected on the exposure to light. This advantage, however, is offset in many cases by the wonderfully beautiful effect of numerous aniline colors, and by the more difficult method of application in the case of the former. The specific gravity of mineral colors being rather high in most cases, they will naturally tend to settle toward the bottom, necessitating crutching of the soap until it is too thick to drop the color. For mottled soap, however, cinnabar (vermilion) and ultramarine are still largely employed.

For transparent soap, of course, mineral colors are not applicable, as they would detract from their transparency; for milled soap, on the other hand, they are very well adapted, as also for cold-made soaps, which require crutching anyway until a sufficient consistency is obtained to keep the coloring material suspended.

A notable disadvantage in the use of aniline colors, besides their sensitiveness to the action of light, is the fact that a majority of them is affected and partly destroyed by the action of alkali. A few of them are proof against a small excess of lye, and these may be used with good effect. Certain firms have made a specialty of manufacturing colors answering the peculiar requirements of soap and being very easy of application, as they are simply dissolved in boiling water and stirring the solution into the soap. To some colors a little weak lye is added; others are mixed with a little oil before they are added to the soap.

For a soluble red color there were formerly used alkanet and cochineal; at present they have been displaced to a great extent, on account of their high cost, by "fuchsin," which is very cheap and of remarkable beauty. A very small amount of it suffices for an intense color, nor is a large proportion desirable, as the soap would then stain. Very delicate tints are also produced by the phthalein colors, of which those named rosbengal, rhodamin and eosin are most commonly used. These colors, when dissolved, have a green fluorescence which heighten their beautiful effect.

There are also a number of the azo dyes which are suitable for soaps, and these, as well as the phthalein colors, are principally used for transparent soaps. For opaque soaps both aniline and mineral reds are used, among the latter being cinnabar, chrome red and iron oxide. Chrome red is a basic chromate of lead, which is now much used in the place of vermilion, but as it becomes black on exposure to an atmosphere containing even traces only of sulphuretted hydrogen, it is not especially adapted for soap. Cinnabar gives a bright color, but it is high in price. Iron oxide, known in the trade as colcothar, caput mortuum, etc., is only used for cheap soaps.

For yellow there are also a considerable number of colors. Among the natural colors these are prominent: Saffron, orlean curcuma (turmeric) and caramel (sugar color); the first named of these is now hardly used, owing to its high cost. Of the yellow aniline colors, special mention is due to picric acid (trinitrophenol) martius yellow, naphthol yellow, the yellow azo dyes and auramin. If it is an orange that is wanted, a trace of fuchsin (red) may be added to the yellow colors named. The use of some unbleached palm oil with the stock answers a similar purpose, but the color fades on exposure. A mineral yellow is chrome yellow (chromate of lead), which has the same advantages and disadvantages as chrome red.

NEWS AND GOSSIP FROM FRANCE.

Paris, Dec. 14, 1897.

M. ALFRED DITTE

who has just been elected to the Academy of Sciences, has occupied the chair of Mineral Chemistry at the Sorbonne since 1888.

Born at Rennes (Brittany) in 1843, he was educated at the Ecole Normale, Paris, which has produced so many brilliant scientists, and took his Sc. D. degree in 1870. Three years later he was appointed chemistry professor at Caen, and stayed fifteen years in the old Norman city. When he left, in 1888, he was already chevalier of the Legion of Honor and dean of the faculty, and had written several important works. His "Elementary Treatise on Qualitative Analysis of Minerals" has run through two editions; his articles on "Some General Properties of Bodies" appeared in 1881, and in 1884 "Tin and Its Compounds" and an "Elementary Treatise on Chemistry" (this latter has since appeared in German). Since his arrival in Paris he has published "Lessons on Metals" (2 vol., 1891-1892), while his articles in the scientific magazines are too numerous to mention. He is perhaps best known by his studies on the dissociation of salts by water, and his researches on vanadium and the alcalino-ferrous chlorophosphates. The Academy of Medicine has elected two new pharmaceutical members. One is Prof. Bourquelot, of the Paris School of Pharmacy, of whom I have so often spoken in these columns recently. The second is

M. Alfred Ditte.

PROF. POUCHET

who since 1892 has occupied the chair of Pharmacology and Materia Medica at the Paris Faculty of Medicine. A Parisian by birth, he has passed all his scientific career at the Faculty. Preparator of biological chemistry in 1879, M. D. in 1880, with an essay on "Exhaustive Matters in Urine," assistant professor in 1883 (thesis on "Aldehydes"), lecturer on Medical Chemistry in 1889; he received the Legion of Honor in 1892, and is to preside over the Therapeutical Society during the coming year. His lessons on Pharmacology have attracted some attention; he claims that it is the base of all medical science. In 1894-5 he treated of sero-therapy in its relations with pharmacology, and many of his lectures present a special interest which has led to their insertion in the scientific journals. It is highly probable that his works will be published in book form later on.

Prof. Pouchet.

The Crusade Against Patents

still continues. At Toulon last month the Southeastern Federation, representing nine departments, unanimously voted that any agreement with the venders of proprietary articles could only be detrimental to the pharmacist. M. Fortune, the retiring president of the Federation, was complimented on his services, and M. Gamel, of Nimes, was named chairman for 1898.

At the Police Courts

several Paris pharmacists' assistants, together with a receiver of stolen goods, were recently convicted and condemned. It transpired that some of the former were not "first offenders," and the magistrates and lawyers expressed their surprise that the pharmacists should not have been more careful in inquiring as to the characters of their employés. It was hinted that the assistant in such a responsible profession should be of unimpeachable morality as well as of a certain intelligence, and that the public interest—if not their own—demanded more careful supervision in this respect.

French Naval and Colonial Pharmacists,

once one and the same body, form two separate classes now that the Colonial administration is severed from the Admiralty offices. So "colonial" pharmacists and doctors are to be denied military rank and privileges, and be recruited from civilians in future. The Naval Health School at Bordeaux (refer Era, June, 1896) will probably be broken up. Protests are being made, and it remains to be seen whether these decisions will not be altered.

Lectures on Pharmaceutical Legislation

are a new feature in this year's curriculum at the Paris School of Pharmacy, Mr. Coutant, barrister, is to treat the subjects of prescriptions, secret remedies, poisons, adulteration, inspection, trade marks, professional secrecy, apprentices, illegal competition, responsibility for errors in dispensing, and other points of law interesting to the pharmacist. These subjects form no part of the examinations, and attendance is, of course, optional. Unfortunately the day and hour fixed (Thursday morning) coincide with several lectures on compulsory subjects, and many who would willingly gain useful hints are thus compelled to be absent. The experiment is an interesting one and deserves a fair trial.

M. Henri Fortune.

The Council's Decision.

Mr. F. L. Heim, the young professor to whom I alluded last month and whose face and name will be familiar to those who attended the Brussels Congress of Pharmacy, has been informed by the Council of Discipline of the Paris University that his dismissal has been decided upon. From this decision he has appealed. It will be remembered that the accusations brought against him were the misappropriation (or unauthorized removal to his own laboratory) of various books, specimens and instruments belonging to the Faculty of Medicine. Without expressing any opinion on a case not yet definitely closed, I may just remark that in France, where all these collections are paid for by money raised by taxation, such matters are necessarily most strictly dealt with. Prof. Moissan recounted to the five academies, in his recent wise and witty discourse, his profound astonishment, when (while visiting the collections)

At Columbia College

the professor who acted as his cicerone offered him a sample of silicificated wood which he seemed to admire. "I glanced instinctively round to see if no guardian was looking," said M. Moissan, "when he put the magnificent specimen into my hands." But what was still more extraordinary to the French professor was that the article was neither marked, numbered, or catalogued. "It is only in Amedica," he declared, "that such a thing can be seen."

A new and general method of obtaining

Metallic Carbides

was explained by M. Moissan to the Academy of Sciences a fortnight ago. A metallic oxyde is placed in the electric furnace together with carbide of calcium in fusion. The oxyde is reduced; the metal uniting with the carbon, while the oxygen combines with the calcium to form lime. Crystallized carbides of aluminum, manganese, tungsten, molybdene, titan, and chrome have been thus obtained. Metals that will not unite with carbon are simply melted, as lead, bismuth and tin.

Silicium is also easily reduced in the manner above described, and the carbide of silicium or carborundum now manufactured at Niagara, and I believe largely used in America, may possibly thus be more readily and cheaply produced.

ODDS AND ENDS.

There are 1,845 students at the Paris School of Pharmacy, including 24 foreigners, and two ladies.

Dr. Metchnikoff (Institute Pasteur) thinks Czaplevski & Hensel's microbe may turn out to be the real cause of whooping cough, but that it is too early to pronounce an opinion.

The Figaro, quoting from the Berliner Post, states that Dr. Behring receives nearly $18,000 monthly from the firm which has the monopoly of his anti-diphtheric serum, and patriotically opposes the fact that Dr. Roux does not receive a penny for his discovery.

M. Rigaud, the new pharmacist-deputy, has presented a bill to the Chamber for a new railway to Neuilly, the suburb which elected him to Parliament.

The police have made a raid on certain Paris pharmacies, and seized therapeutic serums manufactured without the government permission required by the law of April, 1895.

M. Trouessart reports a chemist found mites (Tiroglyphus Siro) in blacking. Although 5 cgms. of bichloride of mercury per kilo had been added purposely to keep the substance free from insects, they swarmed to such an extent that the blacking was entirely desiccated.

Pasteur has a new statue at Melun, near where he made his experiments regarding anthrax. His bust at Boulogne-Sur-Mer is to be unveiled after Christmas.

Picric Acid

is used by Dr. Gaucher for eczema (chronic, and sometimes acute). The parts affected are painted every two days with a 1-100ths solution of picric acid and then wrapped in cotton wool. Cure is said to be speedy, and certain in most cases. M. Thierry says that for small burns an alcoholic solution of the acid should be used. The alcohol evaporates and leaves a dry dressing at the end of a few minutes. It is a little more painful than the aqueous solution, but more efficient.

To cleanse the hands after operating with this acid M. Prieur uses a very weak solution of carbonate of lithine. Dr. Labadie-Lagrave puts ammonia in the water—more or less alkali as needed—and washes off with soft soap.

Traumatol

(cresolum iodatum) seems to be gaining favor in Paris hospitals; by its use, it is hoped, dressings will need to be less frequently changed. Cultures of staphlococcus placed on gelatine plates and sprinkled with iodoform showed putrefaction after 48 hours, where traumatol was used; the eleventh day found the plate still intact. It is therefore claimed to have six times the antiseptic value of iodoform; it is far less poisonous, neither caustic nor irritant, and is stated to cost only half as much. M. Kraus says it is "odorless"—its smell has certainly not the penetrating and all pervading character that characterizes iodoform.

The Anti-Cutting Scheme

seems doomed to failure. It will be remembered that the patent medicine manufacturers promised to adopt the proposal of 5,000 pharmacists signed in its favor before Dec. 15. The date has just arrived, and though no official figures are yet published, I understand a few hundred names are still required.

Caventou and Pelletier.

At the annual meeting of the Paris Academy of Medicine on Dec. 14 M. Bergeron, perpetual secretary, read an interesting biography of Joseph Caventou, father of the present president of the academy, and discoverer of quinine. After retracing the facts already familiar to your readers, he dwelt especially on the disinterested action of Caventou and Pelletier, who might, he said, have made a large fortune if they had kept their process secret and monopolized the fabrication.

At the same meeting, M. Cadet de Gassicourt, annual secretary, read the prize list for 1897. This gentleman is a lineal descendant of the famous apothecary of the 18th century.

A Disastrous Fire

occurred on Dec. 14 at Aubresby's liquorice factory, near Uzès. The building and stock were alike consumed and 300 men will be thrown out of work for months.

THE SCIENTIFIC DEPARTMENTS OF OUR DRUG MANUFACTORIES.

The times have changed in America when the pharmacist was simply the importer, perhaps part owner of the ship which brought his cargoes to our shore. He has now become not only a merchant, but a manufacturer; not only a manufacturer, but a scientific producer; and in the particular realm of science to which he devotes himself, he has few superiors in practical chemistry. We might, however, say the same of many other leading industries. Indeed, it is the tendency of the time that directness, simplicity and economy govern all manufacturing establishments. Even the beer breweries now employ expert chemists who test the various productions, estimate the value of the hops, and malt, govern temperatures, and give directions as to the length of time to be occupied by given processes. The chemic laboratories attached to the establishments of manufacturing pharmacists, have grown to be very extensive, very complete, and give employment to the highest order of attainment. It is natural, then, that men engaged in such pursuits should seek some outlet through which the world must become familiar with their studies, investigations and results. This has led to somewhat irregular or rather desultory methods of establishing quasi-medical journals or tracts of uncertain publication, and various papers which, excellent in themselves, have fallen short of the mark and failed to reach those for whom they were intended by their being handicapped with the suspicion of commercial interest.

The time has come, however, when the vast stock of chemic and pharmaceutic knowledge stored in these great laboratories must be made available to the American medical profession.

Dr. Squibb, of Brooklyn, New York, well known as a manufacturing chemist of note, several years ago pointed out the way whereby the experiments made in his laboratory could become the property of the profession.

Squibb's Ephemeris was the result, and it at once took a high rank in the profession, and we have not learned that the sale of the products of the laboratory of Dr. Squibb has been in any way hampered or lessened by his giving in scientific form not only the means whereby these different products can be tested and their purity established, but the formulæ whereby they were best prepared. Therein lies a lesson for other manufacturers who have large establishments and even greater facilities for work of the highest value to the dispensing pharmacist and practicing physician. Let us have more scientific productions from the great laboratories of our manufacturing chemists. Let them publish their methods, the scientific experiments which they make, and when they have attained clear and definite results let them be boldly stated. Not only will they gain in the opinion of the medical profession, but it is more than probable that the value of a scientific name will be appreciated by the profession in such a manner as to make it pecuniarily profitable not only to issue ephemerides, but regular working bulletins and monographs. Some of the manufacturing establishments in Europe have been pursuing this course for some time, and we understand that from time to time some of our own manufacturers have published occasional monographs or "working bulletins," but the systematic output, if we might term it, of the scientific investigations conducted under the direction of our leading firms has not, we believe, been at any time regularly or completely carried out.

This result, we trust, will shortly be accomplished, and it is probable that with its accomplishment there will come the end of that series of products classed under the name of "secret preparations," which have in the past given rise to so many controversies, and such wide differences of opinion between the medical profession which should be working for the common unity of the profession. If it be urged that a large number of these manufacturers are engaged in general trade, and that therefore they do not become personally responsible for the character and chemic purity of every product shipped from their establishments, it may be answered that the division of their establishments into general and scientific departments, so that any products bearing the label of the scientific department would at once be prima facie evidence of its purity, and in this case the objection would fall to the ground. There would be no question in the mind of any of the members of our profession if at the head of each scientific department so created, a well-known scientific man were placed, in order that there would be a definite responsibility for any statement made by him.—Journ. Amer. Med. Assoc.

CHRONOLOGY OF COAL-TAR COLORS.

Coal tar had long been a favorite study with chemists before Perkins' discovery of mauvine, in 1856; such products as anthracene, aniline, benzol, phenol, toluol and others being well known to them. In 1841 Zinin demonstrated that aniline was a derivative of benzole. In 1856 Natanson discovered a red color, due to the oxidation of aniline. In 1858, Hofman obtained magenta from aniline and carbon tetrachloride. In 1859 Verguin demonstrated the commercial possibility of magenta from the mixture of aniline and toluidine. In 1860 Medioc gave the practical process of its mannfacture by oxidating aniline and toluidine with arsenic acid. The appearance of mauve and magenta mark "red-letter" days in the history of dye-making, both being events of rare commercial interest.

In 1861 Girard and De Laire discovered an aniline blue. In 1862 Nicholson produced a preparation from magenta and aniline with acetic acid, and in the same year Wancklyn prodneed a like result with benzic acid. The latter method is now employed. The same year Nicholson found that by treating his insoluble blue with fuming sulphuric acid it became soluble. In 1862, also, Usebe produced aldehyde green, the first of its class, and now in disuse. In 1863, Lightfoot discovered aniline black, the fastest and most difficult of blacks. The same year an English firm—Roberts, Dale & Co.—gave us aniline yellow and Bismarck brown.

In 1886 Kekulé demonstrated the chemical structure of benzole, which event was of very great importance to the manufacturing world, rendering, as it did, the making of coal-tar colors a practical possibility. In 1866 Caro and Wancklyn both prepared aurine from rosaniline. Rungeas had achieved the same color from another method in 1839. In 1867 Girard and De Laire gave us diphenylamine blue. At the same time the authors of aniline yellow and Bismarck brown introduced the first indulines. In 1867, Poirrier showed the first violet, at the Paris Exhibition. Iodine green appeared about the same time. In 1868 Graebe and Liebermann announced their important discovery of alizarine from anthracene by converting it into anthraquinone; they sulfonated the latter, melting the product with alkalies. Just previous to this Perkins had discovered safranine. In 1874 the eosines made their initial appearance.

In 1877, Prudhomme announced alizarine blue. This was another important year of discovery—in the bringing forth of the azo colors, the most numerous of the dyestuffs; malachite green, by Fisher and Doebner; methyline blue by Caro. The first of the azo colors were produced by Williams, Thomas and Dower; the first azo scarlets by Meister, Lucius and Bruning, and by Poirrier. In 1881 indophenol and gallocyanine appeared.

In 1896 Congo red, the first of the direct series of azo colors suitable for dyeing unmordanted cotton, appeared. The same year appeared the first of the rhodamines, a class of basic dyes related to the eosines, but giving a more stable and equally brilliant dye. In 1890, there appeared the alizarin Bordeaux and alizarin cyanines, and such mordant colors as galloflavine, alizarine yellow A, etc. The chromotrops appeared in 1891, as did also those chrome colors which are capable of effecting a dye upon either mordanted or unmordanted wools.

Outside of the coal-tar colors, in 1859, Greville Williams obtained a dyestuff from a quinine base, which he called cyanine. In 1880, Baeyer produced artificial indigo from cinnamic acid.—A. Ashmun Kelly, in Dyers' Journal.

THE SUCCESSFUL MAN.—The late Sir Andrew Clark, in addressing his students on one occasion, said he presumed those present wonld like to know from him what conditions he thought were essential to make a man a successful physician. Here are the opinions he expressed on this point: "Firstly, I believe that every man's success is within himself, and must come out of himself. No true, abiding, and just success can come to any man in any other way. Secondly, a man must be seriously in earnest. He must act with singleness of heart and purpose; he must do with all his might and with all his concentration of thought the one thing at the one time which he is called upon to do. And if some of my young friends should say here, 'I cannot do that—I cannot love work,' then I answer that there is a certain remedy, and it is work. Work in spite of yourself, and make the habit of work, and when the habit is formed it will be transfigured into the love of work; and at last you will not only abhor idleness, but you will have happiness out of the work which then yon are constrained from love to do. Thirdly, the man must be charitable, not censorious—self-effacing, not self-seeking; and he must try at once to think and to do the best for his rivals and antagonists that can be done. Fourthly, the man must believe that labor is life, that successfnl labor, with high aims and just objects, will bring to him the fullest, truest, and happiest life that can be lived upon the earth."—Manitoba Lancet.

SOME OBSERVATIONS ON ORGANOTHERAPY.*

By J. McWALTER, L. R. C. S. I.

The classical experiments of Professor Victor Horsley have awakened a new era of medication. The dominant idea is to supply from the healthy organs of some animal the deficiencies of the patient's secretory glands. This idea cannot claim to be a novel one; it is probably older than Aristotle, and even in their most savage state men seem to have had some intuition of the propriety of appropriating the healthy organs of the lower animals with a view to becoming imbued with their particular virtues. Thus we are told that certain African tribes fortify themselves for battle by partaking of the orchitic extract of the lion, believing that thereby they become infused with leonine valor.

Dr. Horsley's experiments proved that to graft the gland on the living animal produced the best results, but that to consume them as an ordinary article of diet was also efficacious; whilst even to cook them like ordinary meat did not destroy their virtues.

This evidence that the active principle of the gland, whatever it may be, is not of a protean or evanescent character has unfortunately stimulated manufacturing chemists to take extraordinary liberties with it, and to indulge in a series of vagaries as to the forms in which it should be dispensed to patients. Thus the glands were dried, powdered, mixed with some foreign substance, and compressed into pellets. They were macerated in varying proportions in glycerine, alcohol, and sundry other solutions, and the most diverse and contradictory reports as to their effects are constantly appearing in the medical papers.

In my humble opinion the compressed tablet form is about the worst possible one to elicit the virtues of the gland. I believe it to be a blunder to dry it, a worse blunder to powder it, and a grievous error to mix it with any other powder; whilst to compress the product is to still further attenuate the chances of the active principle entering the system. I believe that the various serious symptoms which physicians have found to follow their administration were due to various poisonous toxalbumins generated by the action of moist air on the tablets.

If there be any animal extractive used in medicine of which we have anything like an adequate acquaintance, it is pepsin; and this ferment owes its present pre-eminence to the unselfish labors of pharmaceutical investigators, who have constantly striven to elaborate the active product, and to free it from inert, nauseous and harmful constituents. If, therefore, any manufacturing house were to offer us a tablet, and state that it was equivalent to 5 grains of a fresh pig's stomach, surely we would laugh it to scorn. Yet have we not firms, boasting to represent the newest and most elegant pharmacy, claiming no more for their tablets than that they represent an equivalent of another gland. I fear, gentlemen, that the responsibility for this state of things is in some measure due to the fact that you have allowed your proper function as pharmacists—to elicit, abstract, elaborate, and make elegant and effective the various remedies which the medical profession may wish to investigate—to be usurped by some large commercial firms. These houses seem to have monopolized for the moment the ear of the profession, whilst they hypnotize chemists by their stories of research laboratories, scientific staffs, unrivalled facilities, etc., and paralyze pharmaceutical criticism by the prices they pay to the press.

It may fairly be asked whether I have any better method to suggest for the exhibition of animal extracts than the compressed concoctions which I have just condemned. Without claiming to throw much light upon the subject, I would promise that in administering glandular remedies we seek to copy a physiological process, and, therefore, we should be guided by what takes place normally in the organism. Now, the process of secretion in any gland may very roughly be considered as an osmosis—that is, certain constituents of the blood are elaborated and allowed to filter through by means of a differentiated epithelium and a basement membrane.

Copying this process, then, I suggest that the proper plan to extract the active principles of animal organs is to remove them immediately on the death of the animal, so that the molecular life of the organ may, if possible, be preserved, and at once macerate them in a sterilized solution of glycerine, made alkaline or acid, according to the nature of the gland. Thus for the pancreas one would use an alkaline solution, and for the stomach a slightly acidone.

The resulting solution should afterwards, I submit, be subjected to a process of dialization. Dialysis, as a method of extracting the active principles of drugs, is one I believe to be of great value, and its employment in the preparation of animal extracts will be found very useful in separating the colloid constituents, and obtaining a closer approximation to the active principle.

Since the demise of Dr. Brown-Sequard, and the introduction of the tablet form, the orchitic extract has fallen into disrepute, but it will probably be found of great use, especially in cerebral cases, when a really active extract shall be produced. The method which I advocate for the preparation of this is to macerate fresh sliced glands in a solution containing 30 per cent. of glycerine, and 0.6 per cent. each of chloride of sodium, phosphate of sodium, and bicarbonate of sodium. The same solution will probably be found the best solvent for the ovarian extract, though the virtues of this are much more dubious.

Extract of red bone-marrow is best made, I think, by macerating the fresh marrow in glycerine. The effects of this preparation, when well made, are little short of marvelous, and it is well worth the investigations of physicians and pharmacists.

The experiments of Claude Bernard have proved that post-mortem changes in animal organs go on with such rapidity that for a very long period an unchanged organ seems never to have been investigated; hence the importance of asepsis in the preparation of the remedies, and the necessity of preserving them from such changes by their immediate immersion in some such preservative fluid as glycerine.

Gathered here to-day are the elite of pharmacy who prove by their presence their desire to lift themselves above the level of mere money-grubbers, and to do some real service to suffering humanity. Proud shall I be if any feeble words of mine can induce them to investigate the properties and preparation of animal extracts, and to rescue them from those traders whose chief desire seems to be to reduce every organ and tissue of the body to their own special pill, pellicle, pellet, or potion, no matter how obviously unsuited such may be to present in its full potency the remedy sought after.

COSAPRINE is a sulphur derivative of acetanilid, in the form of a grayish white, inodorous powder having a slightly saline taste. It is more soluble in water than acetanilid. It is an energetic antipyretic and is claimed to have several advantages over acetanilid.—(L. Union Ph.)

DETECTION OF COTTONSEED OIL.—Into a test-tube put equal parts of the suspected oil, amyl alcohol and carbon disulphide, which has 1 p. c. of sulphur in solution. Heat in a boiling solution of salt for 10 to 15 minutes and observe the change in color. Cottonseed oil colors red or orange. If the result is negative, add a little more carbon disulphide and heat again for 10 to 15 minutes, Repeat again, if necessary. Heating in boiling water also produces the reaction, but more slowly. From 5 to 10 p. c. may be detected by this reaction.—(Ap. Ztg.)

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*Address to the British Pharmaceutical Conference.

WHAT THE DRUGGIST MUST KNOW.

The hieroglyphic, orthographic, caligraphic and chirographic difficulties which beset the path of the druggist are oft astounding. A few of those met by a couple of our readers are shown, as well as is possible without photographic reproduction, in the following lists of queer orders received:

From George W. Fitzgerald, Georgetown, Ky.—Mr. fitegurl Pleas Send me this litle Bodle of Whisky for speshil Youse and o Blige Eliza G.; Corn starch 10c Scotch Oneill 10c Benezie for cake; ladys Silk gum ruber cardrige; 5c Epsy Sauce; oil bais; gum Lackum; Due ese drops; balsam capeefy; rubber instrument with wire in it, price 35c; please send me 5c worth of osonic for the rats for they about to eat me out of the house; one botle of Bigge; dr loue reuces proddile drops and oil of penrile; a box off Colobilic acid; 10 cents werth Morhean pills; mother Winslow's soothing sirp it is 25 cts a bottle; calmual flowers; 5 cts worth Alowes ½ Pint jin; Gumraba; please send me five cent of Alues I do not mean Alum I mean alues; Blue Persiptia; sulphrated zynct; Syrup of Eppyseak; Obeedeel Dock; 5 cts Oile of Burgamont 5 cts w of amonia 20 cts werth of alleiahall; Tartarasit; Sulphetic Sink and rain watter; ari dine; Glisiren and Berreme; Daregarek; one pt whisky 25 ct one pt Watter 05 ct one pt Withasle 10 ct; Balsamcom Peilie; mr george fitsgerl please send me five cents Worth of love powers and ablige to you; Sir. clerk I want the bigge. and not. no. blister I want it for interjection N. B. Bigge; syrup of I dy of Iron; Please send me 5 ct of morphine Habit oblige Miss. ——; 5c worth of Bitter of allway I want and I want it to weain a baby so Pleas be shure and dont; one box of pulgris pursimens regegladeor; go to Mr. Fitchals Drug store he will put up three capsulas. Crosiplament For Fistto on a Horse; Cask Keerray; for roometics 1 teaspoonfll of ridders soda inn a glass of fresh milk evey nite; pleas fill this if possibly the docter say i must have it wright way and 5 Cent Wearth tince off ideau i trie and not asc yu for no more if i can help it; oberdilkdock; oil a baise; Cemotorter.

Hood & Grantham, Dunn, N. C., have been asked to wrestle with these: Mink medicin in little long bottle; 5 cents worth Improved Iron; Dose Calema an Soda an the Sealige powder with it; Please Send Me 15 ct Warth of Bram Piells an fill This SuBCriptian Please for This Girls Mary Jane Smith. 1-3 Sugar and lead; the at Wood Linment; Peculiar Ointment; The duction of Iron; Bark Horncattle powders; Niple with a pump to it; One ville Spearits of Nitia; Liquid of Opadildoc; Barcolic Acid; one Niple for Baby Nurcer; Ten cents worth that Stuff Smells like a wet Sheep; This is a memorandam pleas send me Sum Vasoleana Vasaleanno sum of the Best if you pleas the Best you have Holmoil. I want some of these here tity niples that goes in bottles; one bottle of qonion and one Dost of Calmion one five cts Worth of Salts; Give me one dose of Bromo Excelsior; Please Seade mea 50 Piles c c White; Bottle of cof syurp and o Blog; Artimic Spirits of Amonia; one dollas worth of oppin; Sir Robt Williams sends for 1 bottel of that at Wood Medisen for the Grep Col; 2 pacgeres dinu Dy; 5 cts Worth of Oil Balsom CoPiBa; Wants 5 cts Worth of Oil Saint Wood; Wants 5 cts Worth of Oil terpeni, Wants 5 cts Worth Oil larlea.

EXTRACTUM KOLÆ SICC. BERGENAU is prepared by means of a solution of common salt as menstruum and the strength adjusted with milk sugar to represent the drug weight for weight. The extract has the characteristic strong odor and taste of the nut and is well suited as a basis for all kinds of kola preparations.—(Ph. Post.)

TO DEODORIZE IODOFORM.—Among the numerous substances heretofore used by physicians to free their hands of the odor of iodoform none seems really to merit the name of deodorizer. Dr. Coustan, of Montpelier, has discovered that it is only necessary to wash the hands in orange flower water to remove the odor in a very short time.—(L. Union Ph.)

TRIBROMSALOL is used for insomnia and epilepsy. It differs from the preparation previously known by the same name in that it is capable of combining with acids and alcohol radicles. Sparingly soluble in alcohol and ether, easily soluble in chloroform.—(Ph. Post.)

PHARMACY.

OINTMENT FOR CHAPPED SKIN.—

℞ Lanoline	3 ounces
Glycerin	4 drams
Boric acid	1½ drams
Salol	1 dram
Hoffman's anodyne	5 drams
Menthol	15 grains
Oil of citronella	3 minims

—Journal des Practiciens.

CEMENT FOR MENDING RUBBER GOODS.—The following method of repairing the cracks or fissures in articles of caoutchouc is given in L'Industrie Textile. First clean the surface of fissure or parts to be united very carefully, and apply a cement composed of:

Sulphide of carbon	20 parts
Gutta-percha	2 parts
Caoutchouc	4 parts
Fish glue	1 part

The edges of the rent should be kept together by means of thread and the article left to dry. At the end of from twenty-four to thirty-six hours the binding thread may be removed and the cement which may have squeezed out of the fissure cut away.—(India Rubber World.)

EVILS OF THE PHYSICIAN'S DISPENSING HABIT.—The Atlantic Medical Weekly is moved to say the following, which will be appreciated by pharmacists: "The habit of supplying tablet triturates is getting to be an evil. Whatever we may think of the habit of counter prescribing indulged in by certain druggists, there is no question but that our patients at times suffer by our desire to furnish them with medicines. Certain medicines cannot be given with advantage in tablet forms and some tablets according to their formulæ contain more ingredients by weight than the tablet weighs. The greatest objection to the use of tablets is that one is apt to prescribe for his patient, not exactly what he needs but what you have got in your case. This tendency to prescribe according to the exigencies of the pocket case is growing and should be stopped. The medical profession has on hand besides these mentioned a choice and varied stock of evils which it will be glad to supply to intended reformers at less than cost. Apply to any doctor who has been in possession of his diploma for twenty-four hours, for fuller information."

ARTIFICIAL DIAMONDS.—According to the Engineer, a new process for producing artificial diamonds has been experimented on successfully by Dr. Quirino Majorana. The present method consists fundamentally in heating a piece of carbon by the electric arc, and then submitting it to a violent pressure by means of a small plunger actuated by a piston, on which a pressure of 5,000 atmospheres was suddenly developed by explosion. When a sufficiently strong cylinder had been constructed to withstand this enormous pressure, the experiment produced a black mass consisting largely of graphite and amorphous carbon. On employing Berthelot's method to isolate the diamonds if they existed, small microscopic crystals were obtained, mostly black and opaque, but which exhibited all the properties of true diamonds, notably in their manner of burning at a high temperature. "The conclusion drawn from these experiments," says Nature, "is that pressure and heat are alone sufficient to transform amorphous carbon into the crystalline or diamond form, and that the presence of a metallic solvent, as in Moissan's experiments, is not essential to the transformation."

POTASSIUM IODIDE PILLS.—For each pill: Potassium iodide, 0.2 gm.; wheat starch, 0.5 gm.; dextrin, 0.02 gm.; simple syrup, as much as needed. The pills are dried rapidly, rolled in talcum and kept in a dark place. They remain white and, although hard, dissolve in less than two hours. Dextrin is preferred to gum arabic because of the acid reaction of the latter.—(Ap. Ztg.)

THE SALT HABIT.—The Journal of Hygiene speaks thus of what it terms "the salt habit": "The use of salt as a condiment is so general and so universally believed in as necessary that we rarely hear a word against its excessive use, but there are a multitude of persons who eat far too much salt; eat it on everything—on meat, fish, potatoes, melons, in butter, on tomatoes, turnips and squashes, in bread and on a host of foods too numerous to mention. To so great an extent is it used that no food is relished which has not a salty taste, and this hides more or less the real taste, which is often very delicate. Now, the amount of salt required in the system is comparatively small, and if the diet has been rightly compounded, very little is necessary. Some go so far as to discard its use altogether, but whether this is wise or not we will not here consider. What are some of the evils of the excessive use of salt? They are to paralyze the nerves of taste, or to pervert them so that they cannot enjoy anything which has not a salty flavor, and in addition there is a direct tax on both the skin and the kidneys in removing it from the blood. Whether the skin is harmed by this tax we do not know. Possibly it is not greatly injured, yet we know that few people possess a healthy skin; but it is now pretty well settled that an excessive use of salt does overtax the kidneys in its removal, and that the great number of cases of derangement and disease of these organs is due to this use. It takes only a little time to learn to enjoy many kinds of food without salt, and we advise our readers and others to look into this matter and to try and diminish the use of this condiment as far as possible. We believe they will be better for it."

THE TREATMENT OF CHILBLAINS.—M. George Thibierge contributes a long article on this subject to the Journal des practiciens, of which the following is the substance: When the lesions are constituted by red elements, with little or no infiltration of the skin, zinc-oxide ointment to which has been added a small quantity of carbolic acid or menthol, such as the following, will suffice to allay the pruritus and cause the rapid disappearance of the lesions:

℞	Zinc oxide	150 grains
	Carbolic acid	8 grains
	Vaseline	225 grains
	Lanoline	225 grains

M.

Another formula is this:

℞	Zinc oxide	150 grains
	Menthol from 3.5 to	4.5 grains
	Vaseline	225 grains
	Lanoline	225 grains

M.

If the elements are more prominent, more inflamed, the preferable treatment is with an ointment containing lead salts, such as the following:

℞	Lead subacetate	30 grains
	Carbolic acid	8 grains
	Zinc oxide	225 grains
	Vaseline	300 grains
	Lanoline	300 grains

M.

Or the following formula may be employed:

℞	Lead subacetate	30 grains
	Bismuth subnitrate	90 grains
	Rousseau's laudanum	15 grains
	Vaseline	150 grains
	Lanoline	150 grains
	Lard	150 grains

M.

These formulæ may be modified.

EUPHTHALMIN is the hydrochloride of a synthetic alkaloid that has chemically the same relation to "Eucain B.," as homatropine has to tropacocaine. It is stated to be a powerful mydriatic, having several advantages over the older mydriatic alkaloids.—(Südd. Ap. Ztg.)

DERIVATION OF MEASURES.—In an exceedingly interesting letter to Scientific American, W. F. Quinby, of Wilmington, Del., says that the measures which we call avoirdupois are derived from the one foot cube; and the troy and apothecaries' weights and measures are derived from the one foot sphere, the grain being 0.004 cubic inch of water, and 250 grains in the cubic inch of water.

The one foot sphere is peculiar. It is 3.1416 feet in circumference. It has a surface of 3.1416 square feet. It will contain the apothecaries' pint of 28.8 cubic inches 31.416 times. It will contain 31.416 apothecaries' pounds of water or wine of 7,200 grains to the pound, and 31.416 troy pounds of wheat of 5,760 grains to the pound. If there are eight pints in a gallon it is equal to 230.4 cubic inches, which has been rounded off by legislation to 231.

The two foot sphere will contain 31.416 of these gallons, and 314.16 pounds troy of water or wine. This was probably the origin of the old wine barrel, which is now set down at 31½ gallons. Two of these barrels will make a hogshead of 62.832 gallons, now rounded off to 63. Four of these barrels will make a pipe or butt of 125.664 gallons, rounded off to 126. Eight of these barrels, or the four foot sphere, will make a tun of wine of 251.328 gallons, now rounded off to 252. Ten of these barrels will make a chaldron. A tun of wine will just balance a chaldron of wheat. The outside content of the coffer by measure of Prof. Greaves will hold 6,000 pounds troy of 5,760 grains to the pound; 5,000 pounds avoirdupois of 6,912 grains to pound; and 4,800 pounds apothecaries of 7,200 grains to pound; also 600 troy gallons and 500 avoirdupois gallons of water. No measure but the one foot rule will produce these results, and it is the radius of the two foot sphere.

EATING BEFORE GOING TO BED.—A writer in Italia Termale (says Nat. Drug.) is not much in favor of the theory that late suppers are injurious. He declares, in fact, that many persons who remain thin and weakly, in spite of all precautions in regard to diet, etc., owe the fact largely to abstemiousness at night. He says, very truly, that physiology teaches us that, in sleeping as in working, there is a perpetual waste going on in the tissues of the body, and it seems but logical that nourishment should be continuous as well. The digestion of the food taken on at dinner time, or in the early evening, is finished, as a usual thing, before or by bedtime, yet the activity of the processes of assimilation, etc., progress for hours afterward, and, when one retires with an empty stomach, the result of this activity is sleeplessness and an undue wasting of the system. "All other creatures," says the writer, "outside of man, are governed by a natural instinct, which leads those having a stomach to eat before lying down for the night. The infant, guided by the same instinct, 'takes the breast' frequently, in the night as well as day, and if its stomach is allowed to remain empty too long it shows its discomfort by noisy crying. The digestive organs have no need for repose, providing, always, that the quantity of nourishment taken within the twenty-four hours does not go beyond the normal limit. The fact that the intervals between meals is short works no inconvenience, but, on the contrary, tends to the avoidance of feebleness which is the natural result of an interval extended to too great a length. Feeble persons, lean and emaciated people, and, above all, those suffering from insomnia, owe it to themselves not to retire without taking some nourishment into the stomach—bread and butter, a glass of rich milk, a few biscuits (crackers), or even a bit of juicy cold meat, for instance." We quite agree with the writer in all he says in regard to the folly of the idea of the harmfulness of a light lunch before retiring.

ACTION OF CATHODE RAYS ON SALTS.—According to R. Abegg (Ztsch. f. Elektrochem., Jr. Soc. Ch. Ind.) the surface changes produced by the action of cathode rays upon the haloid salts of the alkalis are the more remarkable because these salts are among the most stable known. The discovery was made by Goldstein, who regarded the change as being of a physical nature. These changes were afterward investigated by Elster & Geitel, and by Wiedemann & Schmidt, and it was suggested that the change was a chemical one, which took place with formation of sub-haloid salts. The author has made experiments with the object of deciding between these two views. Potassium chloride, sodium chloride, and potassium bromide are converted respectively into violet, brown, and blue modifications by the action of cathode rays in vacuo. There is no evolution of gas nor do the colored salts when dissolved in water give any alkaline reaction (i. e., if the salts originally taken are neutral and carefully purified). Their color is not discharged by the action of chlorine, nor do they themselves decolorize permanganate solution. But by the heating action of very powerful cathode rays they can always be transformed back into the white form; and this again, after cooling, can be changed into the colored modification by a short exposure to the rays. These facts are not in accordance with the view that the colored substances are sub-haloid salts; they tend to show that the change is a physical one. The change does not appear to affect the solubility of the salt. Cathode rays exercise no reducing action upon cupric chloride, although the brown anhydrous cupric chloride is easily transformed into the white cupric chloride. Moist cupric chloride becomes blackened when exposed to sunshine. Cathode rays do not produce this effect, but, like sunlight, they color calomel faint yellow. They turn silver chloride a deep violet black. This color is scarcely changed by the heating action of powerful cathode rays. The behavior of silver bromide is different. It is colored by cathode light (as by sunlight) deep grey. This color is changed by heating to the original yellow (or perhaps nearer orange) and can be darkened again by light or cathode rays. As these changes take place in the dry salt in vacuo, they cannot well be due to any reduction or loss of chlorine or bromine.

CAOUTCHOUC AND GUTTA-PERCHA CEMENTS.—Scientific American translates from the Färben Zeitung a number of excellent formulas.

A gutta-percha cement for leather is obtained by melting together 100 parts gutta-percha, 100 parts asphalt or pitch, and 15 parts oil of turpentine. It is to be used hot.

Elastic gutta-percha cement, especially for fixing soles to shoes, which does not crack in bending, on account of its great extensibility, is prepared by dissolving 10 parts gutta-percha in 100 parts benzine and pouring the solution into 100 parts linseed oil varnish, shaking well. The leather must be roughened before using this cement, in order to insure greater durability. By a caseine-borax cement a handsome surface gloss is imparted to the leather. The borax is dissolved in boiling water and the borax solution poured into freshly prepared caseine. The durable thick cement is very serviceable.

Good caoutchouc cements, for rubber strips or rubber goods on metal, are obtained by dissolving shellac in ten times its weight of ammonia. After standing from 3 to 4 weeks a transparent putty results, which is used without heating. The cemented places soften at first, but become hard and firm after evaporation of the ammonia, which may be assisted by heating. This cement is watertight and gas proof, and is also useful for hard rubber articles. A cement made of a mixture of gutta-percha with asphalt is serviceable for the same purpose. This has to be applied hot and the pieces are to be pressed together.

Very useful cement for leather belting is manufactured by kneading 10 parts carbon bisulphide and one part oil of turpentine with gutta-percha until a thick paste results. The portions of the leather where the cement is to be applied must be unoiled and roughened; the cement is put on and the ends are pressed together until the binding agent has become dry.

Directions for caoutchouc cements are (1) 100 parts finely cut caoutchouc, 15 parts resin, 10 parts shellac, dissolved in sulphide of carbon. (2) One part caoutchouc, 7 parts mastic, and 50 parts chloroform, left to stand several weeks.

Cement for rubber boots, etc.: (1) 10 parts caoutchouc dissolved in 250 parts chloroform. (2) 10 parts caoutchouc, 4 parts resin, 40 parts oil of turpentine, mixed and dissolved. For use pour together equal parts of the two solutions.

PHOTOGRAPHS ON WATCH CASES.—Keystone answers an inquiring subscriber thus: There are several processes by which such transfers can be made, but there is really only one proper method for doing such work, and this is performed by a species of enameling, the details of the process for which, we think, have never been given in full. The following can be taken as the outlines of the process, and any workman accustomed to enameling can readily perfect the details. The cap is first prepared by giving it a coating of transparent frit, which gives the appearance of the cap being coated with transparent lacquer, and it is on this glassy coating that the picture is produced by what is known among photographers as the "dusting in" or "powder" process. In carrying out the details proceed as follows: Take a good negative of the actual size of picture required. Next provide a piece of plate glass of suitable size, and after careful cleaning rub the surface with powdered talc, but leaving none of the dust on the plate. Now, prepare a solution composed as follows: Select pure, clean bits of gum arabic to weigh 60 grains; glucose 45 grains; glycerin 10 minims; bichromate of potash 30 grains; distilled water 2 ounces. Mix, warm and filter through muslin. The plate glass has a film of this mixture flowed evenly upon it, and dried in the dark. This surface is exposed under the negative above alluded to, for the proper length of time (to be ascertained by experiment); after which the coated glass (carefully preserved from the action of light) is taken into a cellar or some other place where the air is moist, under which conditions it absorbs moisture proportionate to the action of the light. The portions screened from the light received the most moisture, and consequently are the best fitted to take and hold any dry powder brushed over the surface. The parts of the surface where the light has had full force do not hold any dust. The dust for the purpose under consideration is dial painter's black, a species of intensely black glass ground to an impalpable powder and now used dry. This powder is brushed over face of the print with a camel's-hair brush, and all particles, except such as are held by the tacky surface, are carefully removed. The positive pictures by this process are very beautiful and perfect. To transfer to the watch cap, the picture on the glass has now a coating of tough collodion flowed over it and allowed to dry, after which the collodion film is separated from the glass and the coat of gum and dextrin washed away. The positive picture is now placed on the watch cap (which was previously coated with transparent enamel) with the collodion side out. On heating the cap in a muffle, the collodion burns away and the black enamel pigment fuses and incorporates itself with the transparent glaze on the watch cap.

QUESTION BOX

The object of this department is to furnish our subscribers and their clerks with reliable and tried formulas and to discuss questions relating to practical pharmacy, prescription work, dispensing difficulties, etc.

Requests for information are not acknowledged by mail and ANONYMOUS COMMUNICATIONS RECEIVE NO ATTENTION; neither do we answer queries in this department from non-subscribers.

Formula Wanted.

(E. G. R.) Yager's soldering salts.

Styptic.

(Barber.) The astringent pencil or styptic you submit is anhydrous aluminum sulphate. It is prepared by fusion.

"Mist. N_2C_2."

(J. A. S.) submits the following, which he was unable to dispense:

℞ Mist. N_2C_2 ....℥ iij
Sig. ʒj in water after meals.

This is evidently a "blind" prescription, the prescriber intending that it shall be dispensed by no one but a druggist with whom he has an "understanding." What do our readers say?

Fluid Extract Pinus Canadensis.

(F. R. D.) The following formula will produce a nonalcoholic fluid preparation. We cannot give the formula for the proprietary article:

Pinus canadensis, No. 40 powder	17½ ounces
Water, sufficient.	
Alcohol, sufficient.	
Glycerin	8 fl. ounces

Mix the alcohol and water in the proportion of one of the former to two of the latter, and exhaust the drug by the process of percolation. Distil the alcohol from the percolate and evaporate the remaining liquid to 8 fluid ounces; to the remaining portion add the glycerin.

Formaldehyde.

(F. L. C.) There are but few subjects which have received more attention in the medical and pharmaceutical journals for the past two years than has formaldehyde. You will do well to consult the indexes of the volumes of the Era for 1896 and 1897. Information upon the specific points you raise may be found in the following issues of the current year; Jan. 7, page 12; April 1, page 383; Nov. 4, page 668; Nov. 11, pages 717 and 735. The name formalin has been given to a 40 per cent. solution of formaldehyde in water. This product is manufactured by the Chemische Fabrik auf Actien, vormals E. Schering, Berlin, Germany. The American agents are Schering and Glatz, 55 Maiden Lane, this city, who will upon request doubtless be glad to send you literature upon the subject.

Sensitized Paper.

(E. H.) Workshop Receipts is authority for this formula:

Silver nitrate	5 drams
Distilled water	5 ounces
Nitric acid	2 drops
Kaolin	1 ounce

Dissolve the silver nitrate in the water, and then add the acid and kaolin; the kaolin will not dissolve, its use being to prevent the solution becoming discolored after using. This solution will not require filtering; it must be allowed to settle until quite clear, and when required for use decanted carefully, leaving the kaolin in the bottle; after using the solution should be returned to the bottle and well shaken with the kaolin, which will carry down the coloring matter as it subsides. As this solution rapidly becomes weaker by using, it should be tested occasionally, and sufficient silver nitrate added to restore it to its proper strength (60 grains to the ounce).

American Wine Crop.

(G. C. H.) We cannot give the total production of wine in the United States, for the reason that no statistics are annually gathered (as they are in Europe) either by the State or national authorities. The following figures, from careful estimates, made by the American Wine Press, will give some idea of the total amount of the 1897 vintage in the United States:

	Gallons.
Southern States	1,500,000
New York	3,000,000
Ohio	2,000,000
Missouri	1,500,000
Western States	750,000
California	20,000,000
All other States	1,500,000
Total wine yield	30,250,000

The above figures, if correct, show that two-thirds of the entire 1897 wine crop of the United States was produced in California. This applies only to dry wines, as New York produces about one-half of all the American champagne. The United States ranks sixth or seventh, and follows Switzerland in the amount of wine produced.

Adulterated Zinc Oxide.

(C. B. A.) received the following:

Zinc oxide,	
Bismuth subcarbonate,	
Camphophenique, of each	1 dram
Lanolin	1 ounce

Mix and make an ointment. He says he has prepared this ointment many times and has never had any difficulty with it until recently, when it "turned a pink color and set like cement in the mortar. After scraping the mixture loose from the sides of the mortar it seemed to soften a trifle only." He thinks the trouble is in the zinc oxide which he describes as having "a bitter taste and peculiar odor." He knows the other substances in the ointment are all right and sends several samples of the ointment and a sample of the zinc oxide, the purity of which he questions. An ointment made with zinc oxide of known purity has never given him any trouble. The sample of zinc oxide submitted contained a large quantity of calcium carbonate with traces of sodium, aluminum and iron as impurities, the reaction of phenol with iron probably producing the pink tinge described. This experience emphasizes the desirability of the pharmacist examining and testing everything he buys. It does not always do to trust too much in what the label says. The integrity and purity of the druggist's stock should be verified by personal investigation. It is a duty expected of him and the responsibility which the State imposes upon him forbids that it should be neglected.

Extract of Malt With Cod Liver Oil.

(W. F.) We cannot give the formula for the proprietary preparation. A preparation containing extract of malt with cod liver oil is furnished by the National Formulary. Here are some others:

(1)	Extract of malt	8 fl. ounces
	Cod liver oil	8 fl. ounces
	Oil wintergreen	20 drops
	Oil bitter almonds	5 drops

Rub the cod liver oil very gradually and thoroughly with the malt extract, then add the flavoring oils. If the mixture becomes too thick at any time, thin by the addition of a little water.

(2)	Cod liver oil	by measure	8 ounces
	Extract malt	by weight	8 ounces
	Yelks of two eggs,		
	Powdered tragacanth		16 grains
	Hot water		1 ounce
	Spirit lemon		10 minims
	Spirit bitter almond		10 minims

Weigh the extract of malt in a half pint graduate, add the boiling water, stirring quickly; beat up the yelks of the eggs in a large mortar with the powdered tragacanth; add the oil and extract in alternate portions under constant trituration; lastly, incorporate the flavoring extracts. (Chemist & Druggist.)

(3)	Cod liver oil	6 ounces
	Water	2 ounces
	Extract malt	8 ounces
	Pancreatin	20 grains
	Sodium chloride	40 grains
	Sodium bicarbonate	60 grains
	Oil pimento, sufficient.	

Dissolve the pancreatin, sodium chloride and sodium bicarbonate in the water, add the oil and keep at a temperature of about 32° C. for 3 hours, stirring occasionally. Put the malt extract in a mortar, add the pancreatized oil gradually with constant stirring, and flavor the whole with oil of pimento or other suitable flavoring.

Floor Polish.

(G. W. F.) Try one of the following. We cannot give the formula for the trade-marked preparation:

(1)	Neatsfoot oil	1 part
	Cottonseed oil	1 part
	Petroleum oil	1 part
(2)	Paraffin oil	8 parts
	Kerosene	1 part
	Lime water	1 part
(3)	Yellow wax	5 ounces
	Paraffin wax	2 ounces
	Stearic acid	10 ounces
	Oil turpentine	6 ounces
	Benzin	7 ounces

Melt together by a gentle heat the waxes and stearic acid, add a sufficient quantity of burnt sienna (thoroughly triturated with a little linseed oil varnish). Then add, with constant stirring (remote from fire) the oil and benzin.

(4) Put 1 part yellow wax and 8 parts of coal oil into an earthenware vessel, and set the latter on a hot stove plate until the wax is dissolved. The hot solution is then painted thinly over the floor. As soon as the oil evaporates, the floor should be polished with dry cloths.

(5) As a polishing wax for the floors of dancing halls, H. C. Standage recommends this one:

Potash	1 part
Water	4 parts
Yellow (or bees) wax	5 parts
Hot water, q. s.	

Emulsify the wax by boiling it in the water in which the potash has been dissolved; stir the whole time. The exact amount of boiling is determined by the absence of any free water in the mass. Remove the vessel from the fire, and gently pour in a little boiling water, and stir the mixture carefully. If a fat-like mass appears without traces of watery particles, you may know the mass is in a fit condition to be liquefied by the addition of more hot water without the water separating. Then put in the water to the extent of 200 to 225 parts, and reheat the compound for five to ten minutes, without allowing it to reach the boiling point. Stir constantly until the mixture is cool, so as to prevent the separation of the wax, when a cream-like mass results, if applied in the usual way, on a piece of flannel rag, and polished by rubbing with another piece of flannel.

Moakhoven's Sensitizing Solution.

Silver nitrate	6 parts
Magnesium nitrate	6 parts
Distilled water	50 parts

Each time after sensitizing a sheet in this solution, 1 dram of a one-to-eight solution of nitrate of silver should be added to the bath for every 100 square inches of paper sensitized.

Ferro-prussiate or Blue Print Paper.

(1)

(1)	Red prussiate of potassium	1 av. ounce
	Distilled water	10 fl. ounces
(2)	Citrate of iron and ammonium	3 av. ounces
	Distilled water	10 fl. ounces
	Gum arabic or dextrin	120 grains

Keep these solutions in separate well-stoppered amber-colored bottles. In using, mix equal parts of Nos. 1 and 2. In preparing the sensitized paper, take a solid, firm paper, free from impurities, and apply the solution to the surface of the paper with a soft sponge or a broad, soft brush, being careful not to have the sponge or brush charged too heavily with the solution, or else the paper will have a streaked appearance, which will show in the finished print. Go over the surface of the paper in two directions at right angles to each other so as to insure an even coating. The paper must be allowed to dry in the dark, and in a horizontal position.

(2)

(1)	Iron citrate, soluble	96 grains
	Distilled water, enough to make	1 fl. ounce
(2)	Red prussiate of potash	72 grains
	Distilled water, enough to make	1 fl. ounce
(3)	Potassium bichromate	5 grains
	Distilled water	1 fl. ounce

Mix Nos. 1 and 2, add No. 3; filter quickly, and use immediately. The iron citrate should be in scales, free from powder, and should not have been exposed to light. The prussiate must also be free from any adherent powder.

To coat the paper.—This must be done by gaslight. Pour some of the solution into a saucer, dip a soft pad of absorbent lint into it and pass quickly across the paper. When all the paper has been thus coated take a brush and remove the excess of liquid.

3. This process gives blue lines on a white ground, instead of white lines on a blue ground, as in the ordinary blue print. The sensitive paper is prepared by treating with a solution prepared by mixing the three following solutions: 1. Ferric chloride, 2½ ounces; water, 5 ounces. 2. Acacia, 6 ounces; water, 28 ounces. 3. Ammonio-citrate of iron, 4 ounces; water, 10 ounces. This mixture must be used at once, as it spoils. The "printing" is done in the usual manner, but does not require as long exposure as the usual process. To develop the print, dip first in a saturated solution of ferricyanide of potassium, transfer to a bath of pure water, and thence to a mixture of hydrochloric acid, 1 part; water, 12 parts. Finally, wash well with pure water.

DEFINITIONS.—1. An illusion is a false perception of a real sensorial impression.

2. An hallucination is a false perception without any material basis.

3. A delusion is a false belief; the patient accepts perceptions as facts.—Canada Lancet.

ELECTRIC BELTS.—"An exchange reports," says Electricity, "that in an examination that was made of some 'electric belts' sold by a street fakir, it was found that beneath a strip of gauze was a layer of dry mustard. When the wearer perspired a little the mustard was moistened and set up a burning sensation, and the deluded victim believed a current of electricity was passing through him."

HE HAD SLATS.—One of our readers sends us the following: A bright little eight-year-old boy was sent to the family physician's house one evening, he being a near neighbor, to have diagnosed several eruptive areas of "Vesicles clustered on erythematous bases arranged in the course of the terminal twigs of the intercostal nerves and forming a semi-girdle round the trunk" (Fox); he was informed that he had "shingles" and that he was to tell this to his parents. When he arrived home his mother asked him: "What did the doctor say was the matter with you?" when the little fellow promptly replied: "The doctor said I had slats."—Daily Lancet.

NEW ANTIPYRIN COMPOUNDS.—Ferrisalipyrin (antipyrin ferrous salicylate) is a yellowish brown, indistinctly crystalline powder, showing a green fluorescence. —Nickelsalipyrin (antipyrin nickel salicylate) appears as a pale green powder or nearly white needles.—Cobaltsalipyrin (antipyrine cobalt salicylate) is a pale red powder, which becomes blue when fused.—(Ph. Post.)

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